The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

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Volume 46 Number 4

APRIL, 1940

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Frederick M. Becket
Benjamin T. Brooks
J. V. N. Dorr
Charles R. Downs
William M. Grosvenor
Walter S. Landis
Milton C. Whitaker

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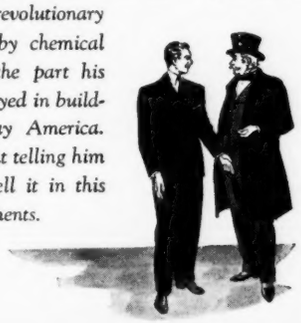
10,000
HORSELESS CARRIAGES A DAY

Suppose someone who lived forty or fifty years ago—say one of the founders of Mathieson—could pay us a visit today. And suppose we could have the pleasure of showing him the sights of 1940, of explaining the vast changes that have taken place since the turn of the century. What do you think would amaze the old gentleman most? If he were one of the pioneers who founded Mathieson, we believe he would be most interested in the revolutionary changes wrought by chemical progress and in the part his successors have played in building the present-day America. We would go about telling him the story as we tell it in this series of advertisements.



● **Yes, Mr. M.—the modern world is using over forty million motor vehicles, and a new generation has grown up who never heard the old jeer, "Get a horse!" New highways criss-cross the continent, dotted with fleets of motor-trucks, motor-buses and a multitude of family cars.**

Your successors at Mathieson, Mr. M., have had their share in promoting the growth of the great automotive industry which has "put the world on wheels". For Mathieson Chemicals enter into the manufacture or processing of nearly everything about the modern motor vehicle—glass, upholstery, tires, lacquer finish, plastic and metal parts, high test gasoline, oil and grease—even lamp filaments in headlights and anti-freeze in the radiator!

Constantly pioneering—constantly improving production and distribution methods to achieve new standards of quality and economies in raw materials—Mathieson has made basic contributions to the development of this and other great American industries.

MATHIESON CHEMICALS

SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . HTH PRODUCTS . . . AMMONIA, ANHYDROUS and AQUA . . . FUSED ALKALI PRODUCTS . . . SYNTHETIC SALT CAKE . . . DRY ICE . . . CARBONIC GAS . . . ANALYTICAL SODIUM CHLORITE

THE MATHIESON ALKALI WORKS (INC.)
60 E. 42ND STREET, NEW YORK, N. Y.

The Reader Writes—

Wants No Quacks

I suggest that you include more detailed data on New Products and more abstracts. Also a good bibliography of current technical books—no quacks

ROBERT GLASSER,
Wheeling Steel Corp.,
Wheeling, W. Va.

Liked "Modern Coatings"

Persistently publish articles such as "Modern Coatings" which appeared in October, 1939, issue.

S. C. ORFORD,
Federal Chemicals Pty., Ltd.
Victoria, Australia.

Trade Names

Keep up the good work on listing trade name products in the Guidebook. I also suggest that you create, over a period of years, a running index of uses of various well-known chemicals and make the pages in loose-leaf form so that they can be filed in a binder.

J. H. BAGG,
Baltimore, Md.

200 Miles From a Big City

We would like to express our appreciation of the fine job you have done with the *Buyer's Guidebook*. Working as we do some 200 miles from any big city, we would be slowed down very much without it to supply the clues as to what chemicals are available and from whom.

EDMUND THELEN,
Research Department,
O. C. Field Gasoline Corp.
Casmalia, Calif.

An Exchange of Views

Why not an exchange of views from various readers in different industries. A discarded discovery in one industry is likely to be very valuable in another.

DR. J. E. JACKSON,
Jackson Laboratories,
Moonachie, N. J.

The Costs of Farm Chemurgy

I feel that you are to be congratulated if your editorial "The Costs of Farm Chemurgy" is typical of your new policy.

In the excitement following the discovery of the word "chemurgic," few people have taken time to consider that many of our large industrial developments today were chemurgic projects. A very large part of the plastics industry and the surface coating industry fall into this classification. It is indeed questionable in my mind whether the large sums of money to be expended by the government on these projects will yield as much return as the work which has been going on quietly for a number of years in industrial laboratories.

T. S. CARSWELL,
Longmeadow, Mass.

Not Perfect—But Excellent

You are always surprising me with innovations which I never would have thought of, yet they fill a demand. "C. I." isn't perfect, but excellent, and I want to congratulate you on your accomplishments.

J. N. CAROTHERS,
Monsanto Chemical Company,
Anniston, Ala.

A Guidebook Questionnaire

We are in receipt of your latest edition, "Buyers' Guidebook" number, and wish to congratulate you on the fine job.

There's one matter we wish to bring to your attention, however, and that is that although we have been regular subscribers to your magazine for a number of years, we still do not find ourselves listed in your most valuable book.

L. F. KEEFE,
K-B Chemical Company,
Billings, Mont.

Editorial Note: Once again we wish to state that our subscription and "guidebook" records are separately maintained. We will mail very shortly the questionnaires for the 1940-'41 Guidebook Number, and suggest that others like K-B Chemical request at once that we send the questionnaire form. No charge is made for lightface listings.

"Human Interest" Stories

I suggest more human interest stories behind chemical developments along lines of "Creating Industries" series but not so long. Use "Time" style.

BERT H. WHITE, *Vice-President,*
Liberty Bank of Buffalo,
Buffalo, N. Y.

Editorial Note: We call to Mr. White's attention and others the new series, beginning in this issue, "Personalities in Chemistry."

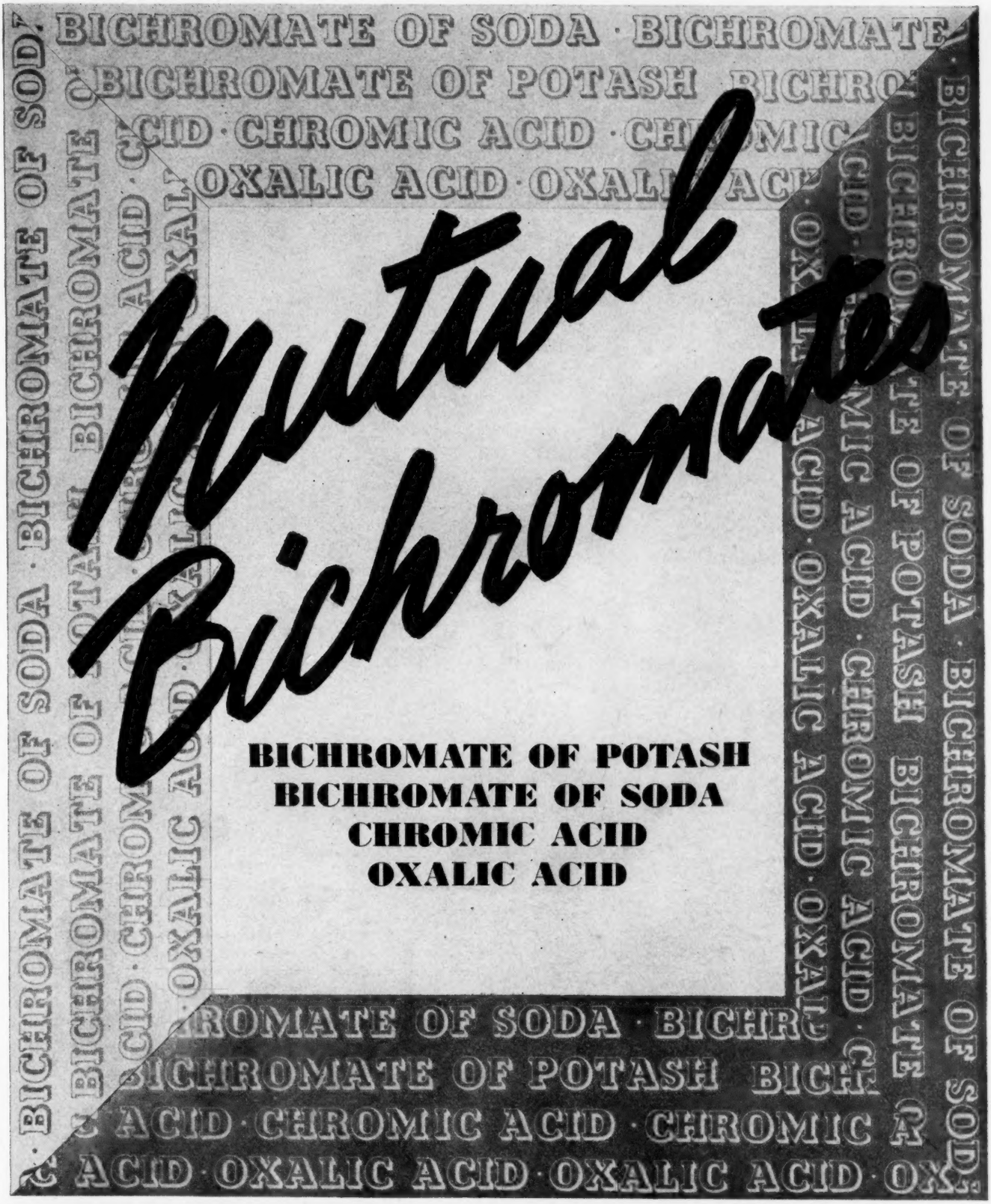
CALENDAR OF EVENTS

April

April 11-12, Rubber Division, A. C. S., Hotel Gibson, Cincinnati, O.
April 11-12, American Gas Association, Accounting Section Spring Conference, White Sulphur Springs. W. Va.
April 11-12, American Petroleum Institute, Eastern District, Division of Production, Columbus, O.
April 15-17, Mid-West Gas Association, Lincoln, Nebraska.
April 16-18, 1940 All-Ohio Safety Congress, Columbus, O.
April 16-18, 11th Annual Greater New York Safety Conference, New York, N. Y.
April 17, St. Louis Paint, Varnish & Lacquer Ass'n., St. Louis, Mo.
April 17-19, Missouri Association of Public Utilities, Excelsior Springs, Mo.
April 18 (tentative), New England Paint & Varnish Production Club, Hotel Vendome, Commonwealth Ave., Boston, Mass.
April 18-19, National Petroleum Ass'n., 37th Semi-Annual Meeting, Cleveland Hotel, Cleveland, O.
April 19, American Section, Society Chemical Industry, Discussion on Foods, Chemists' Club, New York City.
April 19, American Institute of Chemists, New York Chapter, New York City.
April 21-25, American Water Works Association, Annual Convention, Kansas City, Mo.
April 22-23, National Safety Council, Silver Jubilee Convention, Industrial Accident Prevention Ass'n., Toronto, Ontario, Canada.
April 22-25, Society of Motion Picture Engineers, Chalfonte-Haddon Hall, Atlantic City, N. J.
April 24-26, American Institute of Mining & Metallurgical Engineers, Open Hearth Conference, Pittsburgh, Pa.
April 24-27, Electrochemical Society, Inc., Spring Convention, Galen Hall, Wernersville, Pa.
April 25, Chicago Drug and Chemical Association, Noonday Luncheon, Morrison Hotel, Chicago, Ill.
April 26, American Institute of Chemists, Regular Meeting, Chemists' Club, New York City.
April 26, 1940 American Association of Textile Chemists and Colorists, Swiss Chalet, Rochelle Park, N. J. N. Y. local section.
April 26-27, Pennsylvania State College, 9th Petroleum and Natural Gas Conference, State College, Pa.
April 29-30, Liquefied Petroleum Gas Association, Inc., Southern Section Meeting, Tutweiler Hotel, Birmingham, Ala.
April 29 to May 2, Chamber of Commerce of the United States of America, Washington, D. C. (Annual Meeting).
April 30 to May 1-2, National Safety Council, 18th Annual Midwest Safety Conference, Chicago, Ill.

May

May 1-3, The American Society of Mechanical Engineers, Spring Meeting, Worcester, Mass.
May 1-3, Petroleum Industry Electrical Ass'n., Dallas, Tex.
May 2, Indianapolis Paint, Varnish & Lacquer Ass'n., Columbia Club, Indianapolis, Ind.
May 3, Baltimore Paint & Varnish Production Club, Baltimore, Md.
May 6, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Building, Chicago.
May 6-7-8, American Spice Trade Ass'n., Annual Meeting, Hotel Astor, New York City.
May 6-9, American Drug Manufacturers Ass'n., The Greenbrier, White Sulphur Springs, West Va.
May 6-10, American Gas Ass'n., Natural Gas Section, Houston, Tex.
May 8, New Orleans Paint, Varnish & Lacquer Ass'n., New Orleans Athletic Club, New Orleans, La.
May 8, Philadelphia Paint, Varnish & Lacquer Ass'n., Phila., Pa.
May 8-11, National Fire Protection Association, Atlantic City, N. J.
May 9-10, American Water Works Association, Ohio Section, Akron, O.
May 9-10, Tanners' Council of America, Spring Meeting, The Greenbrier, White Sulphur Springs, West Va.
May 9-11, American Water Works Ass'n., Pacific Northwest Section, Portland Hotel, Portland, Ore.
May 10, American Chemical Society, New York Section, Annual Meeting.
May 12-17, National Electrical Manufacturers Association (Spring Meeting), The Homestead, Hot Springs, Va.


BICHROMATE OF SODA · BICHROMATE OF POTASH · CHROMIC ACID · OXALIC ACID
Mutual Bichromates
BICHROMATE OF POTASH
BICHROMATE OF SODA
CHROMIC ACID
OXALIC ACID

MUTUAL CHEMICAL CO. OF AMERICA

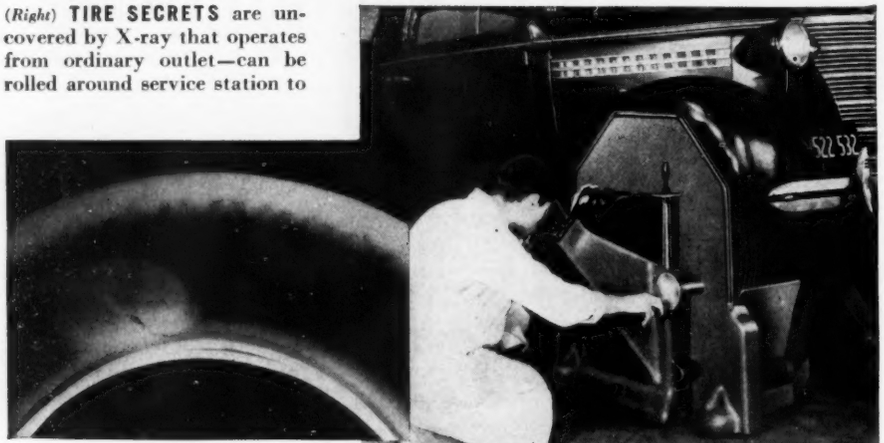
270 MADISON AVE. NEW YORK

PLANTS AT BALTIMORE AND JERSEY CITY MINES IN NEW CALEDONIA

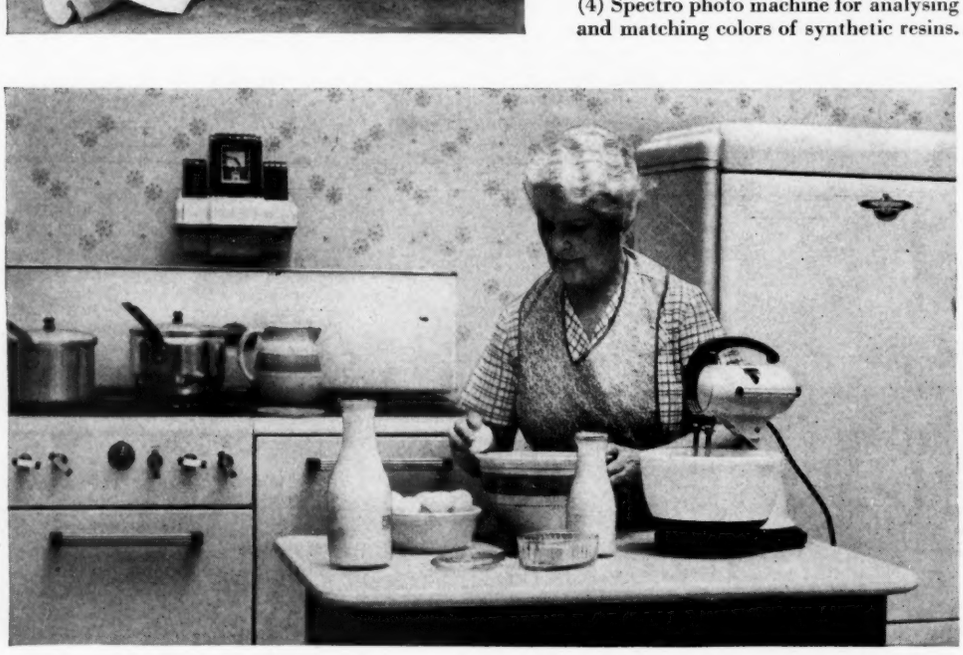
Life ON THE CHEMICAL NEWSFRONT

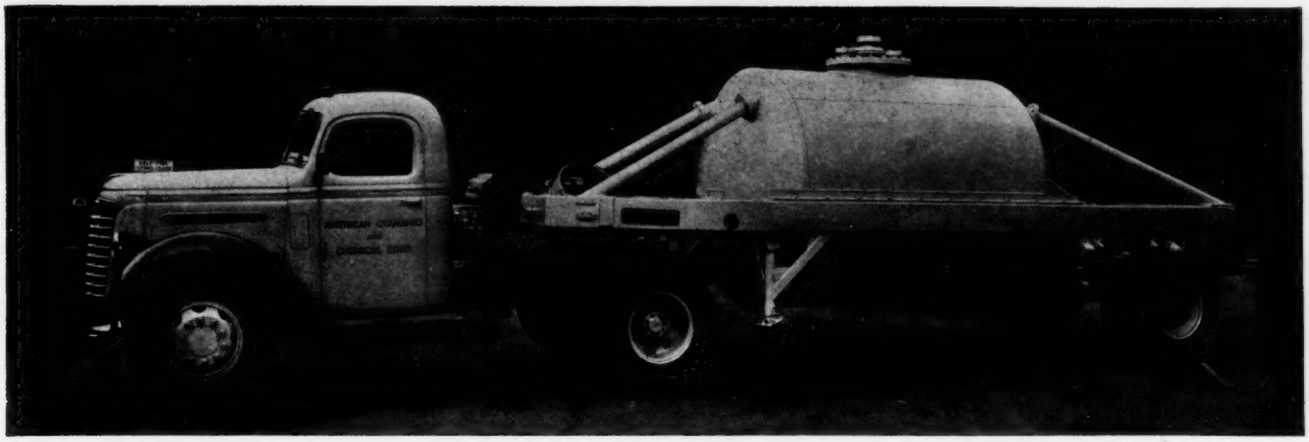
(*Above*) **"IT ISN'T DONE WITH MIRRORS,"** is the title of a new 30-minute talking movie which tells story of resin research at American Cyanamid. The film is available for showing to technical association groups throughout the country. Stills taken from film show: (1) Huge single crystal of salt used in infra-red spectrographic analysis; (2) Automatically controlled resin production equipment; (3) Cold room for low-temperature tests; (4) Spectro photo machine for analysing and matching colors of synthetic resins.

(*Right*) **TIRE SECRETS** are uncovered by X-ray that operates from ordinary outlet—can be rolled around service station to inspect tire without removing it. Inset shows radiograph of stone bruise in tire, typical instance of detection of defect by the X-ray before puncture or blowout can occur.

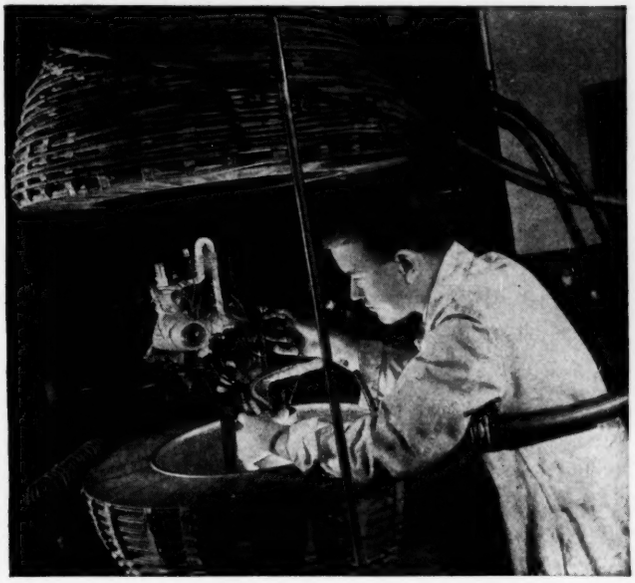


(*Right*) **AMAZING ADVANCES** in baking enamels are promised by Cyanamid's revolutionary new Melamine Resins. These resins offer exceptional opportunities for improving such characteristics as speed of cure at low temperatures; mar-resistant hardness when used in relatively small proportions; gloss and color retention on prolonged subjection to high temperatures; resistance to water, alkali, grease; outdoor durability. Cyanamid's technical staff will gladiy aid in selection and use. Photo shows typical uses for finishes of this type.



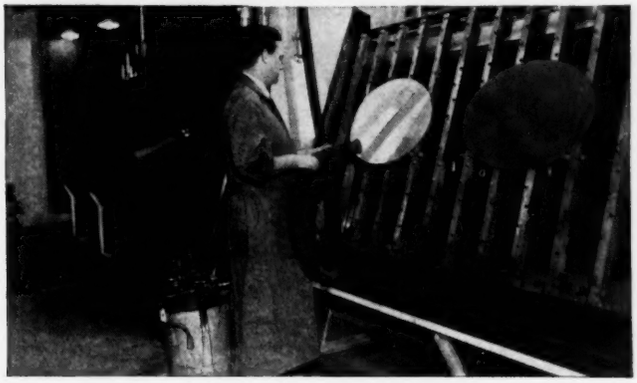


(*Above*) **TRANSPORTATION OF CHEMICALS** is a problem of increasing complexity. Recent development is the tank truck shown here. Trucks of this type, lined with rubber and having a capacity of 2,500 gallons, have been placed in service by Cyanamid for the transportation of corrosive substances without contamination of contents or damage to truck.

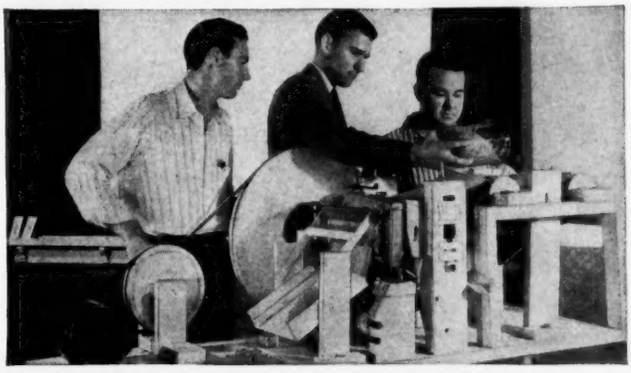


(*Above*) **SORTING MOLECULES** and their constituent atoms roughly according to weight is the unusual task of this spherical mass spectrophotometer devised by Dr. John A. Hipple, Jr., Westinghouse Research Fellow. Device will be used to uncover additional information on the way in which gases break up into their atoms —and the amount of energy needed.

(*Right*) **DEHYDRATING SWEET POTATOES** is new chemurgic achievement, expected to aid in year-round utilization in economical production of starch and cattle feed. Semi-commercial test runs are being made at North Texas State Teachers College on dehydration press developed by Gilbert C. Wilson (center). Assisting Mr. Wilson are Alfred Davis and William McCart. Process is believed ready for commercial use.



(*Above*) **RAPID SILVERING** puts mirror making on production-line basis—does away with old time-consuming method of hand-pouring solution from china pitcher. Secret lies in new solution that can be sprayed on, allows much more rapid deposition of silver plate, is expected to result in finer reflections.



American Cyanamid & Chemical Corporation
30 ROCKEFELLER PLAZA · NEW YORK, N. Y.

ADVERTISING PAGES REMOVED

Products of a Healthy Vine

Products of the factory too, reflect the source from which they spring. They show the care taken in their production and the quality of the materials used in making them. The quality of Niagara Caustic Potash, Caustic Soda and Carbonate of Potash is reflected in the products of Niagara's many customers throughout the country. Make Niagara your headquarters for these important materials.

Niagara ALKALI COMPANY

60 EAST 42nd STREET, NEW YORK, N. Y.

Affiliated with Electro Bleaching Gas Company, Pioneer Manufacturer of Liquid Chlorine

CAUSTIC SODA
CARBONATE OF POTASH
CAUSTIC POTASH

CHEMICAL INDUSTRIES
The Chemical Business Magazine
Established 1914

Personalities or Issues?

THE citizens of this country will be called upon next November to make what in all probability will be the most momentous decision ever squarely to face the electorate. Will that decision hinge upon a soothing radio voice, a face that photographs well, an ability to sport an Indian headdress with a minimum of ridiculousness, a flair for tracking down racketeers, and a reputation for remembering ward politicians' names and a dozen or more equally silly attributes? Or will it revolve around intelligent presentation, discussion and thorough investigation of two diametrically opposed political philosophies?

American business leaders, including several outstanding executives in the chemical industry, are determined, insofar as it is humanly possible to do so, to have not only the political issues clearly defined, but also to challenge the "confidence-destroying attacks of demagogic detractors" within and without the government fold.

Admittedly there have been occasions when the choice before the voters was largely whether one preferred tweedle-dee or tweedle-dum. Unfortunately no such innocuous selection is possible now.

We are not a true democracy in the strict sense of the word and we may find ourselves next November simply making a choice between the lesser of two evils. A concerted effort should be made now to demand standard-bearers who truly subscribe to and personally reflect clearly enunciated platforms, specific in all details and free from the usual plethora of platitudes.

Despite the natural reluctance of the politician, let us insist then, as business men, the importance of issues pertinent to the future development of this country, rather than personalities. Shall the executive rather than the legislative branch determine the tariff policy? Shall the judicial interpretation of the fundamental concepts of the constitution be dictated by one subterfuge or another by the chief executive? Shall private capital and private enterprise be denied a reasonable opportunity to function at a fair profit? Shall government competition with private industry be indefinitely encouraged? Shall labor be accorded unreasonable privileges? Shall all employers be treated as transgressors when in fact only a very small minority are? Shall the inventor and the capitalist be denied the just fruits of their combined efforts? Shall we continue to live beyond our income? Shall we tax private enterprise into the grave?

Private enterprise has given us the printing press, the radio, the movies. The best defense is a concerted offense. Let us present the true issues to the "butcher, the baker and the candlestick maker." Lukewarm efforts will be of no avail.

Editorial

The German Phosphate Pinch Reports from abroad that Germany is suffering a serious shortage of phosphate rock would seem to be confirmed by the 1939 statistics just released by the Department of the Interior. Total exports from the United States to all foreign countries totaled only 949,006 tons last year as compared with 1,140,841 in 1938 and 1,052,802 tons in 1937. At midyear they were running behind the 1938 figures by 78,357 tons and possible recovery was checked by the virtual elimination of shipments to Germany during the last quarter of the year.

There is no reason to suppose that Germany has been able to acquire rock in any material quantities from sources safe from the operation of the allied blockade. As Russell Kent points out in his Washington column this month (page 486) the ability of Russia to furnish Germany with phosphate is indeed very much an unknown quantity for its deposits are near the Finnish border and meager rail transportation facilities have been wholly occupied with war traffic. Even with the Finnish War at an end it is doubtful that Russia can provide sufficient exports to Germany to really make any appreciable dent in the acknowledged shortage. Such a situation must eventually have severe repercussions on Germany's food problem.

Our domestic demand improved somewhat in 1939 but not quite enough to offset the curtailment in exports. Total shipments (domestic and export) totaled 3,703,523 tons valued at $12,167,837, a decrease of one per cent. in tonnage and six per cent. in value compared with comparable 1938 figures.

Export Trade Exports of industrial chemicals in the period September 1, 1939 and January 31, 1940, increased some $19,000,000 compared with the like period a year earlier. On a percentage basis, the rise amounted to 81 per cent. Exports of aircraft and accessories showed in the same period a gain of $48,000,000 (194 per cent.), while cotton exports increased $112,000,000, a jump of 110 per cent. February chemical export figures continue to show phenomenal gains, but, unquestionably, this largely represents purchases actually made in January or even earlier. Currently the cream seems to have been skimmed from the industrial chemical export trade, and several items which were entirely unobtainable even two weeks ago are now available in fairly large quantities. Should "the war of nerves suddenly become a war of bullets" the situation undoubtedly would reverse itself very quickly.

150 Candles On April 10, 1790, the first patent law was enacted in this country as "An Act to promote the progress of useful Arts." Most fitting was the celebration held in Washington this month, and attended by hundreds of American scientists and industrialists, for it conspicuously focused the attention of the entire country on the untold benefits that have accrued to us and indeed to mankind generally because of the incentives it has held out and the protection that it has afforded the inventor.

Few of our cherished institutions have survived the march of 150 years with so little fundamental change. This is in itself a remarkable testimonial to the sound basis upon which it was first conceived. American patent law has served as a model for other countries to follow and so its influence has reached far beyond our geographical boundaries.

It is well to recall on this particular birthday of the system that its principal purpose is not to reward the individual so much as it is to definitely aid in the promotion of science and the advancement of the arts to the end that the general welfare of the nation may be improved. As U. S. Commissioner of Patents Conway P. Coe has so aptly stated, "The individual reward is only the lure to bring about this much broader objective."

CHEMICAL INDUSTRIES has long recognized the importance of the patent system in the life of this country by providing its readers with a monthly digest and check-list of all chemical and allied patents. In this month's issue it helps celebrate a most important milestone in the history of the system by publishing "The International Patent Situation," written by an international chemist and patent attorney, Doctor Armand E. Mestern.

Do Monopolies Quarrel? Strangest incongruity in ages has developed in the fertilizer trade probe down in Winston-Salem. Department of Justice prosecutors haled major factors in the industry into court on charges of gathering behind locked doors and deciding between themselves how best to bilk the poor farmer. Yet, after a month's deliberation, Federal Judge Hayes ruled that he was forced to grant subpoenas asked by Department of Justice lawyers because "attorneys for the fertilizer companies could not agree on a suitable compromise despite my most earnest pleas that they do so."

The decision calling for shipment of several carloads of company records covering operations for ten years, is lightened somewhat by an alternative. If preferable, companies may throw open their books to prosecution investigators who will pore over them in the same manner that F.B.I. men fine-combed the same books last year.

Incidentally, no one whom we have contacted has ever seen a copy of the report F.B.I. investigators filed with the Department of Justice. Considering the fact that it wasn't publicized either before or during the current probe, that report must be an interesting document.

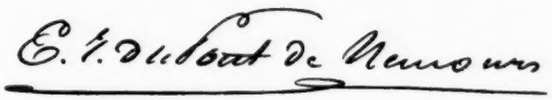
We believe the fertilizer companies should adopt the alternative course. Let the burden of proof fall where it belongs. The idea of haling business into court on fantastic charges and then asking companies to produce records which it is hoped will substantiate the charges, does not make sense to most of us. Let the Department of Justice finance its own witch hunt.

And isn't it in keeping with other incongruities of the probe that the hearing is held in Winston-Salem, heart of the tobacco belt? Why not a fertilizer center, such as Baltimore, Savannah, or Atlanta? Could it be that someone wants to give the tobacco farmers a circus to divert their minds from the fact that Great Britain will be buying none of their product this year? Is the Administration trying to save the planters from the "big bad wolf" instead of saving their markets? After all, it has been successful in giving the unemployed everything but jobs.

"CHEMICAL PIONEERS"

The Founder of Du Pont

By Williams Haynes



ONE sparkling autumn day in 1801 a French veteran of the American Revolution who had served as Lafayette's chief of artillery at Brandywine, Germantown, and Monmouth Junction and after the war had stayed on, took a younger fellow-countryman off on a memorable shooting party. Game was plentiful and by lunch time they had shot away all their British-made gunpowder. At the little cross-road store of John Adlum they refilled their empty powder horns.

Their afternoon's hunting was ruined, however, by the low grade of the high priced domestic gunpowder. Both men were experts in explosives; but their reactions to the spoil-sport powder were quite different. Colonel Toussard fussed and fumed in the testy manner of an elderly military man. His youthful companion said little, but he thought a great deal.

Already this young man was quite famous among his friends for his quiet ways and studious habits. Son of one of the most illustrious and brilliant Frenchmen of his time; younger brother of a strapping beau of notable charm and vivacity, Elèuthere Irénée du Pont de Nemours possessed less showy talents that were nonetheless very substantial. In fact, though but twenty-eight, he had already on more than one occasion proved himself the strong, steady wheelhorse of the family.

The thoughts stirred in this young man's fertile, practical brain by the inferior quality of the American gunpowder for which he had been forced to pay so handsome a price, suggested the possibility that a competent powder-maker might do a nice business in the United States. This idea was born, not of futile resentment, but of young Du Pont's knowledge and first-hand experience. Characteristically he first set to work carefully to check the facts.

He was himself a competent powder-maker. One of the closest of his father's many distinguished friends had been the great chemist Lavoisier and under him Elèuthere Irénée Du Pont had served, first as apprentice, later as the Master's assistant, at the great

Samuel and Anne (de Montchanin) Du Pont, parents of Pierre Samuel du Pont de Nemours, father of Eléuthere Irénée du Pont de Nemours, "The Founder of Du Pont." Samuel Du Pont was a watchmaker by trade.

French arsenal at Essonne. He recognized perfectly the faults of the powder that had spoiled his afternoon's hunting and judged that the price charged was about twice what was fair even for a high-quality product.

That evening he plied the Colonel with questions. He inquired of a capital authority since Louis Toussard was still serving as Inspector of U. S. Artillery and was a member of the commission that was planning the Military Academy at West Point. From the Colonel he learned that the Government was paying 47 cents a pound for gunpowder. That night, calling upon his Essonne experience, he figured out that a single stamping mill and one wheel mill would produce 160,000 pounds of powder a year. At the Government price here was a gross income of $75,200.

He began inquiries into costs. He figured saltpetre at 20c a pound for 120,000 pounds and $600 for sulfur and charcoal—say, $25,000 for raw materials. Labor in the young country would be high. He calculated wages at $9,216.25, and that exact figure is quite typical. Then he set down the Director's salary at $2,000; a similar sum for upkeep; and at the end, $7,183.75 for "losses in manufacture." The total expenses were $45,400.00.

Confirmed and encouraged, he surveyed the competition. There were but three plants in the country, so he learned, and two of these so small that they hardly counted. Accordingly he visited the third. It was located at Frankfort, near Philadelphia, and was owned by William Lane and Stephen Decatur. Their primitive, wasteful methods at once disgusted and delighted him. Shrewdly he measured the market, the Army, the fur traders, Indians, sportsmen, with a possible export to the East Indies and Mexico. Discreetly he investigated building costs.

He then sat down calmly and painstakingly drew up his budget: for land and buildings $36,000; for a year's operating expenses $45,000; output 160,000 pounds of high grade powder; sales $75,000; gross operating profit $30,000. After all these estimates were complete, and only then, Irénée unfolded his plans for an American gunpowder manufactory to his father.

The year before the whole Du Pont family had come to America to make a new life in the New World. The father, Samuel Pierre du Pont de Nemours, one of the truly consistent liberals of those stormy days, had stood bravely, steadfastly for the rights of the people under a constitutional government. As a young man, when Secretary to Francois Quesnay, physician to Louis XV, he had been appointed editor of an official commercial bulletin. His ability as a writer and his profound knowledge of contemporary economic conditions fitted him well for this post; but his advocacy of tax reform, of universal education, of personal liberty, were not in the days of the Bourbon Great King special recommendations to official favors. He lost his editorship.

Later, when Louis XVI came to the throne, du Pont de Nemours was recalled from Warsaw (where he had gone as tutor to the young Polish prince) to become Inspector General of Commerce under his old friend Turgot. Six years afterwards, when Turgot's thrifty administration fell, undermined by intrigues of the profligate courtiers, Du Pont retired to his estate at

Eléuthere Irénée du Pont de Nemours discussing the location of the first Du Pont powder mill with Thomas Jefferson, third president of the United States, his friend and customer.

First powder mill of E. I. du Pont de Nemours & Company, built in 1802 on the banks of the Brandywyne, near Wilmington.

The first office building of E. I. du Pont de Nemours & Co.

Chevannes; but he was soon reappointed to office and was for the next ten years active in public service.

With his friends Benjamin Franklin and the English economist Hutton, he helped draft the treaties at the close of the American Revolution. For this distinguished service the King granted him a patent of nobility, and he was elected a member of the National Assembly, representative of the district of Nemours. As the tempests of the French Revolution rose, he labored manfully to effect reforms which, if adopted, would have averted the bloodshed of the Terror. He sought to curb the King's personal power; to prevent paper money inflation; to secure civil liberties under legal protection for all the people. Later as the fury mounted, he stood forth just as boldly against the violent savageries of the Jacobins. Upon the dissolution of the National Assembly, he retired from public life with his son Irénée and opened a printing house in Paris.

When the mob sacked the Tuilleries he rallied loyally to the personal defense of the King, was recognized, and fled a second time to his estate at Chevannes. Two years later he was sought out and thrown into La Force prison. Rescued from the guillotine only by the fall of Robespierre, he went back to the publishing business which Irénée had been running during these tumultuous years.

But Pierre Samuel Du Pont had no more stomach for demagogic despotism than he had for monarchical tyranny. Accordingly the liberal journal he started was soon suppressed. Again his liberty was in jeopardy and he was only saved from exile to French Guiana by the good offices of Madame de Stael.

His little fortune vanished in the wreck of his publishing business. Without resources, laden with heavy family responsibilities, his friends slaughtered or exiled, the path of public service barred by the rapid rise of the autocratic Napoleon who had little sympathy for his humane ideals, du Pont de Nemours despaired of anything like a truly liberal regime in France. So he naturally turned to America as a political refuge and an opportunity to rebuild his fortune.

In America his cherished ideals of personal liberty under a constitutional government were actually in practice. In America he had friends—best of them, and the most important, Thomas Jefferson, then Vice President—who would help him. His elder son, Victor, had already been in America, serving as French consul at Charleston, South Carolina.

European land-hunger played a great part in the early development of America. Schooled in the security of the landed estate, steeped in the traditions of landed privileges, Englishman and Continental alike counted the opportunity to become a landowner the most tangible reward for the rigors and dangers of pioneer life. Du Pont de Nemours shared this feeling. The first surplus capital he had acquired had been invested in the Chevannes estate. Now at fifty-five his plans for a new life were based upon a great land-owning joint-stock company which he proposed to promote and manage.

Accordingly Du Pont de Nemours Pére, Fils, et Cie., with authorized capital of four million francs, was organized and he with his sons Victor and Irénée and Bureaux de Pusy, who had recently married Madame

Du Pont's daughter by a former marriage, were named directors. Within six months an impressive list of shareholders—Lafayette, Rousseau, General Duquesnoy, Beaumarchais, and the Swiss banker Jacques Bidermann among them—had subscribed for two hundred and fourteen shares.

Upon young Irénée fell the task of winding up the printing business in Paris and the estate at Chevannes; packing the household goods; purchasing the supplies; tending the details of departure. He put in his spare time studying botany.

Young de Pusy and his little daughter, accompanied by Madame du Pont de Nemours, sailed from Rotterdam in May, 1799. They were to find living quarters for the whole family in or near New York. On October 2, 1799, Du Pont de Nemours, his two sons, Victor with his wife and two children and Irénée with his wife and three children, young Charles Dalmas, brother of Irénée's wife; Madame de Pusy and her baby—thirteen in all—sailed in a leaky, barnacle-coated craft. Incompetently manned, insufficiently provisioned, she took three miserable, mutinous, thirsty, months to make the harbor of Newport, R. I. Three days later, the whole Du Pont family were joyfully re-united in a rambling barn of a house which de Pusy had bought on Bergen Point, on the New Jersey shore opposite Staten Island.

At First Just Failure

From the first the American venture went badly. Many subscribers failed to make good their pledges, so the actual working capital was but 241,347 francs. Du Pont de Nemours had counted heavily upon his land development program; but he was greeted by a letter from Jefferson urging against any land purchases. Prices, he wrote, were speculatively high, and aliens could not obtain a clear title in most states. Du Pont visited his old friend at Philadelphia, and upon his suggestion, Victor was naturalized by buying a house in Alexandria, Va. A couple of cargoes were exchanged with Guadeloupe. A fast packet passenger service between Havre and Philadelphia was worked out on paper but nothing definite or remunerative came of all these schemes.

Loyalty to his father could not blind to Irénée the stark fact that half their working capital had been spent; and he began to be gravely concerned for his own future and the wellbeing of his little family. Just at this juncture, he went shooting with Colonel Toussard.

When he brought his powder-mill budget to his father, the project of the passenger packets was in the forefront of Du Pont Senior's interest; and although sufficient funds remained to have launched the gunpowder plant, the older man naturally hesitated to put all his eggs in that one basket. He agreed, however, to send both sons back to France—Victor to forward the shipping plans: Irénée to freshen his powder-making experience and, if possible, to raise additional working capital.

In both endeavors the quiet younger son was successful. Jacques Bidermann was impressed favorably with the proposal, and General Duquesnoy and Louis Necker, brother of the Minister of Finance, also agreed to furnish financial backing. At Essonne Irénée was made more than welcome and all the facilities of the French Government were placed at his disposal. Napoleon was making every effort to cripple English commerce and England at the time enjoyed almost a monopoly of the American powder market. Therefore, young Du Pont's projected factory was something to be encouraged. He was taken in, instructed in the latest, most secret advances in powder-making, supplied with drawings made by government draftsmen on official paper. Machines were even built for him at the Arsenal, including an improved grainer that could be operated by one man instead of ten.

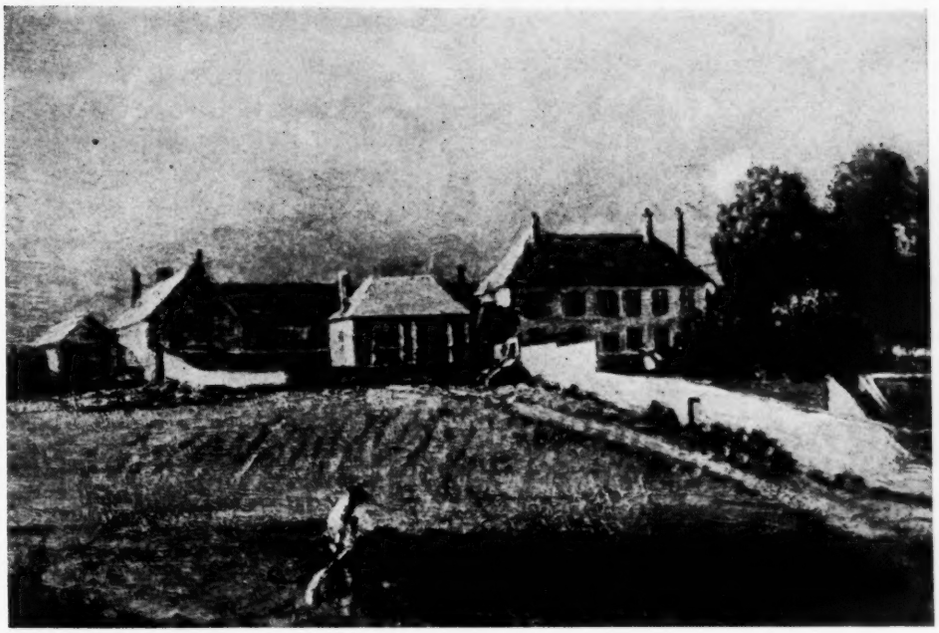
"The establishment of a manufacture of military and sporting powder in the United States of America" was incorporated in Paris, April 21, 1801, capitalized at $36,000 in eighteen shares of $2,000 each, to be built and managed by "Citizen E. I. du Pont" whose salary was fixed at $1,800 per annum. Three months later, his machinery bought and paid for with cash supplied by Bidermann, crated and ready to follow on the next vessel, he returned to the United States.

His financial set-up was still precarious. He had left in cash some $2,000 from Jacques Bidermann's subscription; a cargo of salt (General Duquesnoy's share) worth $4,000; and a pledge of $24,000 from his father's corporation. His machinery was expected to arrive shortly. The immediate problem was to find a site and erect buildings.

Thomas Jefferson was sympathetic to the project from a national point of view. He was alive to any constructive American development and a new, better, domestic supply of gunpowder appealed to him strongly. Through the father, he suggested that a location on the Potomac River close to the recently planned national capital might be exceedingly advantageous. Irénée rode on horseback all over the Maryland and Virginia counties surrounding Washington, but he found no place wholly to his liking. Previously he had explored possible sites along the lower Hudson River and in the vicinity of Paterson, N. J. and he now went to Philadelphia to make an offer on the plant of Lane and Decatur. His proposal was politely declined.

Back to Wilmington, Delaware, he retraced his steps to confer again with his first adviser, Colonel Toussard, and to have another look at a site that had attracted him greatly on his journey northward from the capital.

At Wilmington lived not only his old hunting companion, but also Peter Bauduy, another Frenchman and a friend of his brother Victor. To be in touch with this little community of Frenchmen was assuredly a persuasive influence; but Peter Bauduy presented the clinching argument for the Wilmington location. He



In his day of affluence under the monarchy, Pierre Samuel Du Pont, now raised to the nobility as "Séigneur" Pierre Samuel du Pont de Nemours, returned to the scene of his courtship, there to establish Bois-des-Fossés. The original of this painting (made by the well-known artist, Stanley Arthurs, nearly a century and a half later) hangs in the Wilmington home of a great - great - granddaughter of Pierre Samuel du Pont de Nemours.

offered to buy two shares in the embryo powder company for $4,000—cash. Irénée agreed, and together they purchased the ninety-five acre farm of Jacob Broom, skirting the southern banks of the Brandywine about four miles from Wilmington. The price was $6,740: $2,000 in cash, which was paid down.

Off Irénée Du Pont posted to a family conference in the big house at Bergen Point. Victor, in the meantime, had returned without enlisting sufficient support for the packet service, but bearing letters from high French officials to their Consul General Louis Pichon, suggesting that the firm of Du Pont de Nemours Pére, Fils & Cie. be employed to supply provisions to Napoleon's expedition of 25,000 men, which was organizing in the West Indies to re-capture Santo Domingo. Facing the facts, Du Pont de Nemours decided to salvage his shareholders' investment by setting up Victor in the Government contracting business in New York; by subscribing to twelve shares in Irénée's powder plant; by transferring back to Paris the remaining assets of his original corporation which thus became a holding company.

Not only to explain these changes, but also to carry important messages from Jefferson to Napoleon in the secret negotiations that led to the Louisiana Purchase, he himself determined to return to France. He and his wife sailed on June 1, 1802.

A couple of weeks later, Charles Delmas, Irénée's young brother-in-law, left Bergen Point for Wilmington in charge of three carts of household goods and a flock of merino sheep. On July 19, E. I. du Pont de Nemours, his wife and three children reached the Broom farm.

A Son Reports to His Father

"We have accomplished an astonishing amount of work since August," Iréneé wrote to his father the following February, "but I am dismayed when I think of what is still before us." A big stone house and barn, were built in conjunction with mills. The refinery, and the sawmill were completed and the watercourse of the old Broom mill had been repaired. "We have still to build," he added, "three mills and one or two other buildings; to dig a new race; to make the drying-rooms, the magazine, the workmen's quarters. It is evident that we cannot make powder before the autumn."

Lack of Working Capital

He was laboring under all kinds of handicaps. Skilled workmen were scarce. He and his family were far from well. But most serious was the lack of working capital. Victor's company, which was to make good the Du Pont subscription to his stock, had frozen real estate for its chief assets (the Bergen Point house; a store in Alexandria, Va., and Banker Bidermann's six thousand acres in Kentucky) while the Government contracting business had become tangled up with personal loans to the French Consul General and Jerome Bonaparte. There was no cash available for the powder plant. Accordingly, Irénée turned to Peter Bauduy who doubled his original investment of $4,000 and endorsed notes at the bank for an additional $18,000.

Not till 1804 was powder actually produced for sale and May 1st of that year the following announcement appeared in the New York papers:

> E. I. du Pont de Nemours
> Gun Powder Manufactory
> Wilmington, Delaware

This new and extensive establishment is now in activity and any quantity of powder, equal if not superior to any manufactured in Europe, will be delivered at the shortest notice.

Samples may be seen at V. du Pont de Nemours et Cie., New York.

From the very first batch the quality of the Du Pont powder made good the bold statement of that earliest

advertisement, and sales were all that prudent expectation could calculate: over $10,000 for the first ten months of 1804. The next year they more than doubled to a total of $33,000. In 1806 they dropped back somewhat, but forged forward to $43,000 in 1807. A good beginning had been made, but this did not end Irénée's troubles.

On February 8, 1808 he wrote to his father in Paris:

"But in spite of this success I am still somewhat embarrassed, and as yet have been unable to pay any part of the eleven thousand dollars that I borrowed from the bank, because the first expenses and the completion of the establishment cost more than I had calculated, and because in that calculation I forgot the six months and more credit that we must necessarily allow on all sales; thus there is from twenty-five to thirty thousand dollars due us now."

Peter Bauduy, who supplied most of the working capital and all the bank credit, was not unnaturally concerned over his investment. He became unreasonably critical of Irénée's management, and charge and counter-charge were laid before Victor in New York and the father in Paris. Through Victor's good offices their differences were patched up, and the illmated partners were held together by mutual self-interest strengthened by the marriage of Bauduy's son Ferdinand to Irénée's eldest daughter, Victorine, in November, 1813.

Original office chair of the founder of the Du Pont Company used for 100 years by his successors.

However, the truce was always an armed one. It was interrupted by quarrels and eventually by a law suit, and finally settled, after the early death of Victorine's young husband, by Peter Bauduy's withdrawal under protest from the firm. The two were not at all fitted for close association. Bauduy was a jolly, easy-going chap, a good mixer, a capital salesman; but careless in the details of business, vain, and personally ambitious. Irénée, as he himself confessed, was "cold and sensitive." Hard-working, serious-minded, proud of his little plant and jealous of his product, the founder of Du Pont, harassed as he was by lack of funds, disturbed by the financial tangles of his father and brother, was in no mood to take criticism kindly or to brook interference with his management.

Just as the powder mills were getting nicely into production Victor Du Pont's trading firm failed. Consul General Pichon, who had endorsed Victor's Santo Domingo drafts, was dismissed from office under a cloud, leaving him with uncollectible claims against the French Government for over four hundred thousand francs. Three years later, in 1811, Victor and family came to Wilmington, and were established in a woolen mill backed by his brother and Bauduy.

Since profits from the sale of cargoes sent to France by Victor's company had been the chief income of the Du Pont de Nemours stock company, the sole tangible asset was now twelve shares in the powder company—for which Irénée had received, not $24,000 but $16,470.90. His father now divided these twelve powder company shares among his own stockholders, sugaring their disappointment with sanguine accounts of Irénée's success and the prophecy that the one-third powder company share would shortly be worth more than their old full share in the land company. His optimism was to rise up and plague his son.

French Stockholders Protest

The French stockholders began demanding that, according to the terms of incorporation, Irénée buy them out upon six months notice. He replied that he could not do so, explaining that it had been necessary to borrow working capital from banks and that powder was sold in this country on long credit, so that cash was always scarce even when business was good. They protested unreasonably but violently when all the profits of the first five years operations were used to repay part of these loans and to purchase raw materials. Their complaints increased when Victor was set up in the woolen business. A climax was reached—and now Bauduy sided against him—when in 1813 Irénée, for $47,000, bought the estate known as Hagley adjoining their land in order to enlarge the powder mills.

All these controversies were complicated because it took six months to exchange replies across the ocean, so Jacques Bidermann decided to send his son, Antoine to Wilmington to sift the truth and protect his invest-

ment. Trained in finance, this level-headed young man, began a judicial examination of the affairs of the company. Though at first prejudiced against E. I. Du Pont, he concluded that his accounts, which had been questioned, were quite in order; that his management was efficient; and that he certainly knew how to make good

Original Du Pont home on the Brandywine.

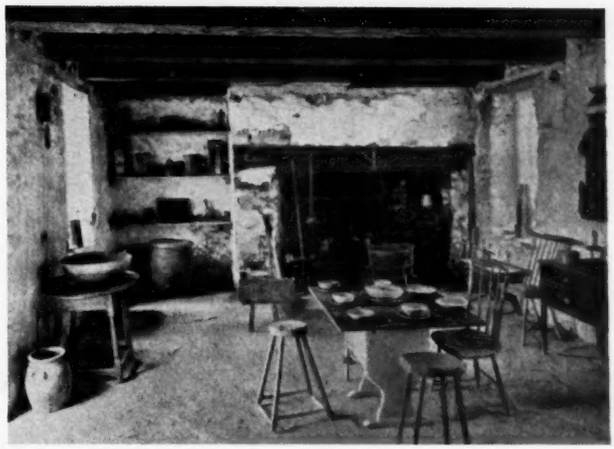
gunpowder. Young Bidermann, therefore, assisted in Bauduy's withdrawal, and in February, 1815 took his place in the company.

The Father Returns to America

For ten years the Du Pont brothers had been urging their father to come back to America. But the old gentleman, though no favorite at Napoleon's Court, was happily engaged in editing the literary works of his old friend Turgot; and after Napoleon abdicated, he was named Secretary of the Provisional Government. Upon the restoration of Louis XVIII, he was made a member of the Legion of Honor and of the Council of State, where true to his sincere convictions, he did not hesitate to oppose reactionary measures proposed by the King. When Napoleon returned from Elba, he obtained a passport from the American Minister, and rejoined his sons and their families at Wilmington. Two years later, August 8, 1817, he died in Irénée's big stone house. A couple of days before he had helped fight a fire that had threatened the powder mills. He caught cold and the end came swiftly.

His death closed the career of one of the great champions of humanity. From youth to old age he lived close to the swirling vortex of one of history's greatest, most dramatic social revolutions. His ideals remained fixed. Neither rich bribes of political preferment nor the bitter threat of exile or death could swerve him. Arbitrary power unjustly used whether by the King, Danton, or Napoleon, he opposed courageously, and his conceptions of government, of education, of commerce and agriculture, were all far in advance of his time. He was truly one of the world's great liberals.

The death of Pierre Samuel du Pont de Nemours precipitated a crisis with the French stockholders of



In the first floor the family lived and cooked. A great-granddaughter of the first occupant maintains the home.

his son's powder company. He had repeatedly staved off their demands and doubtless they regarded him as their special representative in this far away enterprise. Now that he was dead they insisted upon the immediate repayment of their original investment in cash and with interest to date. Legal dissolution of the company was threatened when a catastrophe—the explosion of five powder mills that wrecked the entire plant and destroyed 85,000 pounds of powder—forced a compromise. With a series of long term notes E. I. Du Pont was able to buy all the stock of his foreign shareholders.

The next ten years history of the Du Pont Company is an epic of frugality, persistence, and courage. The wrecked plant was rebuilt. Bit by bit—almost literally dollar by dollar—the staggering load of debt was lifted. This herculean task was made the more difficult due to the general business conditions of the times. America was in an era of notable expansion. The West was opening up. Roads and canals were building. Stimulated by the first protective tariff (enacted in 1823) new industries were springing up in the New England and the Middle Atlantic States. The demand for capital was insistent and the need for ready cash imperative. Thus credits of six, nine, even twelve months were demanded—and granted—for all sorts of commercial transactions. Speculation was rife, and alongside sensational gains there were also stunning losses.

Forced to rebuild and expand his plant; compelled at the same time to wait months for payment of every shipment of powder he made; borrowing at high interest from the banks to finance these operations and at the same time meeting his purchase notes, Irénée du Pont struggled forward under a load that would have crushed a less courageous soul. From 1817-19 his losses from the explosion and the bankruptcies of numerous agents and creditors, totalled over $140,000. But in 1820 the tide turned. Slowly but surely the business grew and the debts shrunk.

During this period his best customer was John Jacob Astor's American Fur Company. Year after year their purchases of powder for hunters and trappers ran in the neighborhood of twenty-five thousand dollars.

When Irénée had first launched into powder-making he had expected that the United States Government would be his first and most substantial customer. Thomas Jefferson, his father's firm friend, had openly encouraged him in the enterprise, for it fell perfectly in line with the President's policy of encouraging developments that built the young nation strong and economically independent. This expectation withered and in January, 1809, Irénée was forced to write his father: "The Secretaries only employ men when they cannot do otherwise, regardless of their Chief's wishes. Things are done here much as they are in France. They have given the refining of saltpetre to an apothecary"—Dr. Hunter of Philadelphia—"who does not understand it and who spoiled ninety thousand pounds that the Government gave him to do." In fact, during the eight years of the Jefferson Administration the Government bought but $30,000 worth of Du Pont powder, less than a seventh of their total powder purchases during the eight years, and but a tenth of the infant company's sales during that period.

But during the War of 1812, the Army and the Navy both came to Wilmington begging for gunpowder. The story of the little band of soldiers and teamsters that hacked a road through the wilderness of western Pennsylvania to bring Du Pont powder to Perry on Lake Erie is almost as familiar as the historic message: "We have met the enemy and they are ours," which these munitions helped to write. It is less well known, however, that Du Pont powder helped MacDonough stop the invasion of New York on Lake Champlain and was fired in the muskets of Jackson's men who defended New Orleans. After the feverish war-time, day-and-night activity came the explosion and the grinding years of rebuilding the business and clearing it of debt.

In this long battle Antoine Bidermann bore an important part. His financial experience and good judgment were valuable supplements to Irénée Du Pont's powder-making skill and dogged perseverance. The two worked in perfect sympathy and mutual confidence, and the bond between them was forged closer when young Bidermann married Evelina, Irénée's second daughter.

Among the voluminous correspondence of E. I. du Pont de Nemours which has been preserved are two revealing letters. One lays bare the gruelling strain he labored under, while the other shows how sincerely he had become an American citizen.

From Philadelphia, in 1824, he wrote his wife: "It is cruel to ride sixty miles every five or six days to meet one's notes, and so to waste one's time and one's life. God grant that some day I may get to the end of it."

In 1833 the State of South Carolina threatened to secede from the Union and offered twenty-four thousand dollars for one hundred twenty-five pounds of musket and cannon powder, to which he replied: "The destination of this powder being obvious, we think it right to decline furnishing any part of the above order. When our friends in the South will want sporting powder for peaceful purposes we will be happy to serve them."

Nine months after he wrote that letter Irénée Du Pont died suddenly of a heart attack strikingly similar to the one that had killed his brother Victor on January 30, 1827. A little more than a year after Victor's unexpected death Sophie Delmas Du Pont had also died, and this double loss of wife and brother afflicted Irénée sorely. He gave up the dream of going back to France for a visit and plunged deeper than ever into his work. His sons were growing up and his chief interest became their training in the business.

Already Alfred, the oldest, had completed his studies in chemistry under Thomas Cooper at Dickinson College, and was at work in the mills where his father had fitted up for him a tiny laboratory. The first fruits of this Du Pont research was an instrument that proved there was no relation between the strength and the quickness of gunpowder. Henry, the second boy, was a cadet at West Point. The youngest, Alexis, was still a boy in school.

Watching every detail of the business, Irénée Du Pont learned of the discovery of wonderful beds of saltpetre in Chili and Peru. Instantly he set afoot an investigation, calling upon Lieut. Irvine Shubrick, of the U. S. Navy, husband of Victor's youngest daughter, Julia, to get him a first-hand report on mines, supplies, prices, transport, etc., with samples. These samples he himself analyzed and experimented with, coming to the conclusion that the South American material could not be advantageously substituted for the saltpetre they were importing from India. Characteristically, he wrote out his findings in a painstaking report and deposited it in the company archives from which it was drawn by a grandson to become the starting point of further experiments that revolutionized powder-making.

Company Firmly Established

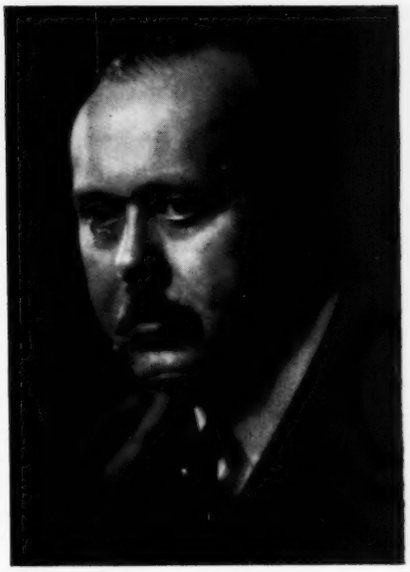
The company was now firmly established. From a single stamping mill, one wheel mill, a drying house and warehouse, it had grown to a plant with a capacity of over a million pounds a year. But its founder did not live quite long enough to free it of its debts. He died suddenly, while in Philadelphia, October 31, 1834.

Eleuthere Irénée du Pont de Nemours did more than lay the foundations. He also drew up a plan of operation and management and he held aloft before his successors an ideal. In the midst of his struggle with Peter Bauduy for control of the destinies of the powder mills, his partner had suggested as a compromise that the firm be known as Du Pont, Bauduy & Company. His reply was curiously prophetic:

"If, as I hope, it earns a reputation greater than that of the others, and if it makes a name—that name should be mine."

And so a century later the company remains today the E. I. du Pont de Nemours and Company.

The INTERNATIONAL PATENT Situation



By Armand D. Mestern

ON April 10th of the current year the United States will celebrate the 150th anniversary of the birth of its patent system.

According to the provision of Article I, Section 8, of the Constitution empowering Congress "to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries" the first patent law was enacted in this country on April 10th, 1790, as "An Act to promote the progress of useful Arts".

The legislators of that era have doubtlessly been influenced by the revolutionary French ideas of the human rights of individuals[1] and by the old English patent law and the significance of the inventions put to work under the protection of this law.

The English "Statute of Monopolies of 1623" is the oldest codification of patent law in the world but a long time before patents had already been granted by the crown of England. As early as 1602 the English parliament decided as follows:

> "Where any man, by his own charge and industry, or by his own wit or invention doth bring any new trade into the realm, or any engine treading to the furtherance of a trade that never was used before, and that for the good of the realm, that in such cases the king may grant to him a monopoly patent, for some reasonable time, until the subjects may learn the same, in consideration of the good that he doth bring by his invention to the commonwealth, otherwise not."[2]

Revolting against King James I. who, as many monarchs before him, abused his right to grant patents, the House of Commons passed the famous Statute of Monopolies of 1623.

On the other hand, the U. S. patent system served as a model for the patent legislation of other countries.

The German patent law[3], although quite different in many essential respects, has been influenced by the U. S. patent system, according to the late Dr. Felix Damme, Director in the German Patent Office and well-known authority on patent legislation.

Commissioner of Patents Conway P. Coe has shown in a statement made before the Temporary National Economic Committee on January 16th, 1939, that the Swiss patent system was inaugurated in 1888 after Mr. Bally, a Swiss industrialist and visitor at the Centennial Exposition in Philadelphia, had declared: "We must introduce the Patent System. America has shown us how. May our sister republic serve as our model in this!"

All the patent laws of the various countries of the world, established in the 19th and 20th centuries, took advantage of the experiences of earlier patent laws and followed them to no small measure.

Talking about the meaning and the importance of the Patent System, U. S. Commissioner of Patents Conway P. Coe explained in the statement quoted above:

> "For nearly a century and a half the American patent system has had the esteem of our citizens. It has been regarded not merely as a lawful institution but also as a benefactor to the nation.—Every individual in the United States, young or old, rich or poor, is in some form, from birth to death, a user and a beneficiary of patents.—
>
> "It is not the principal purpose of the laws of our own country or of any nation to reward an individual. The purpose is much deeper and the effect much wider than individual gain. It is the promotion of science and the advancement of the arts looking to the general welfare of the nation that the patent laws hope to accomplish. The individual reward is only the lure to bring about this much broader objective. Every patent granted benefits society by adding to the sum total of human knowledge."

This holds true not only in regard to domestic patents. Patents issued and published in foreign countries are beneficial to the knowledge of the world at large. Moreover, through the promotion by international conventions many patent applications are simultaneously filed in every country of industrial importance.

Some figures may be of interest. The total number of patents issued in this country amounts to approximately 2,150,000. The totals of patent applications filed during 1937 in some of the industrially important countries follow:

United States of America	65,416
Germany	57,139
Great Britain	36,263
France	17,246
Japan	17,381
Italy	10,590

(All above figures are from "Blatt fuer Patent-Muster- und Zeichenwesen," Berlin, 1939).

Patents granted in any one year as based on the averages of eight consecutive years (1930 through 1937), unless otherwise indicated: (These figures are taken from a report of the U. S. Commissioner of Patents).

Country	*Total*	*Granted to Foreigners*	*Percentage*
United States	48,697	6,421	13.2%
Germany	20,621	5,327	25.8%
Great Britain (1930-35)	18,417	9,522	51.7%
France	20,025	9,994	49.9%
Japan (1930-36)	4,845	1,165	24.0%
Italy	10,634	6,782	63.8%

GERMANY: Patent Applications filed: (from "Blatt fuer Patent-Muster- und Zeichenwesen," Berlin, 1939).

	1937: Total —57,139*	1938: Total —56,217†
Domestic Applications:	48,510	48,241
From the United States:	1,957	1,994
Great Britain:	1,030	930
France:	894	1,165
Italy:	414	513

GREAT BRITAIN: Patent Applications filed during 1938: (From the same source as the German figures).

Total—37,973

Foreign applications claiming priority	11,111
From Germany:	5,449

FRANCE: Patents granted during 1938: (from "Bulletin Officiel" Paris, 1939).

Total:—14,000

To residents of	
United States	1,144
Germany	3,216
Great Britain	890
Italy	299
Japan	27

UNITED STATES OF AMERICA: Patents granted during 1937: (Report of the Commissioner of Patents).

Total:—42,887

To residents of		
Germany	2,106	4.9%
Great Britain	1,178	2.7%
France	559	1.3%
Italy	88	
Japan	68	

[1] Toute découverte ou nouvelle invention dans tous les genres d'industre est la propriété de sou auteur! (From the first French Patent Law).
[2] Darcey versus Allin.
[3] The first German patent law was passed on May 25th, 1877.

* (Of this number app. 7,000 are of a chemical nature or pertaining to chemistry.)
† (Of this number app. 6,500 are of a chemical nature, or pertaining to chemistry.)

The above figures are incomplete and can hardly be used as a basis of comparison inasmuch as the publications of the patent offices in the various countries are issued under differing conditions. They do indicate, however, the close connection between patents and inventions throughout the industrial world. Moreover, the patent offices of many countries cooperate in so far as they exchange among themselves copies of the patents issued by them.

According to the annual report of the U. S. Secretary of Commerce 1,233,204 copies of U. S. patents were distributed to foreign governments during the fiscal year of 1939. Being disturbed by war for the second time within 25 years, these important international connections are now seriously threatened.

In the United States, in accordance with Section 7 of "The Trading With the Enemy Act," passed on October 6th, 1917, the Alien Property Custodian was given the discretion of demanding patents, trademarks, etc., issued to enemy aliens.

He demanded 12,300 patents of Germans and, among others, sold 4,767 of these patents to the Chemical Foundation, 154 to the United States Government, and also surrendered licenses on 5,880 patents to the latter.

After conclusion of peace, compensation to the original owners of the rights was attempted as far as that was possible, and part of the patents were restored to them.

There have been other consequences of the war inflicting damage not only on the belligerents but also on the neutrals. Due to the difficulty and sometimes the impossibility to communicate between the various countries, parties interested in patents were unable to perform in due time the steps necessary for applying for patents or maintaining patent rights, such as filing of applications, filing of amendments and briefs, and paying of the required fees, etc.

This resulted in the abolition or the loss of valuable rights. Later a reparation of the inflicted damage was attempted. I am referring to Articles 306 through 310 of the Versailles Treaty (concerning former belligerents), the Convention of Berne (June 30th, 1930) regarding countries who had not been in war with one another, and the Nolan Act (March 3rd, 1921) passed in the United States. (The United States never ratified the Versailles Treaty.) By these several acts it was attempted to make up for the damages suffered by patent owners.

The Nolan Act, for instance, extended the rights of priority for the filing of applications which had not expired on August 1st, 1914, or which had come up since, for six months from the passage of the act, i.e., to the beginning of September, 1921.

A patent could not be refused on an application coming within the provisions of this act even if the invention had been patented or described or been in public use or on sale in the United States prior to the filing of the application but not prior to the filing of the foreign application upon which the right of priority is based.

It is true that no patent granted or validated by reasons of the extension provided in this Act should, according to Section 3 of the Act, abridge or otherwise affect the right of any citizen to continue any manufacture, use or sale commenced prior to the passage of the Act, but it is obvious in any case that complications and difficulties must arise between the foreign owners of patents and the intermediate U. S. users.

Corresponding laws benefiting American citizens were enacted in foreign countries and also resulted in the belated granting of patents on important inventions.

The insufficiency of the measures taken in consequence of the world war clearly shows that inventors should under all circumstances endeavor to take all necessary steps for securing all possible rights on their inventions in foreign countries and should not depend on possible reparations.

Relations Strengthened

After the end of the world war, international relations between the nations were renewed and strengthened. In the field of patents, the so-called Union of Paris, of March 20th, 1883 (embracing nearly all industrially important countries), was renewed and revised twice; first in The Hague on November 6th, 1925, and then in London on June 2d, 1934. The treaty in its modified London form is binding on the following countries, which ratified it: the United States, Denmark, Germany, Great Britain, France, Norway and Japan.

Of importance are the new regulations of Article 5 which state that a patent shall not be revoked if an abuse can be prevented by granting compulsory licenses on the patent and that a grace period (and occasionally an additional fee) shall be provided for the paying of fees due for maintenance of patents.

After the beginning of the new war, the belligerents have taken strategic positions in the patent field, too. Measures concerning the rights of enemies have been taken. Other regulations are of importance to the neutrals as well.

In England the "Patents, Designs, Copyright and Trade Marks (Emergency) Act, 1939" has been invoked.

"One object of the Act is to enable patented inventions belonging to an enemy to be used or produced in this country by persons who are not enemies or enemy subjects and who already hold licenses for the purpose or can obtain such licenses from the Comptroller.

"Another object is to enable the times prescribed for doing certain acts at the Patent Office to be extended where desirable having regard to war circumstances."

According to an extract from the Order in Council of September 1st, 1939, as published in the Official Journal, no person shall except under the authority of a written permit granted by, or on behalf of, the Comptroller General of Patents, Designs and Trade Marks make any application for the grant of a patent in any foreign country.

Trading With Enemy

As to the treatment of enemy aliens it is stated in an official notice (The Official Journal, London, October 11th, 1939) that under Sections 4 and 6 of the Emergency Act, 1939, the General License of the Board of Trade of September 7th, 1939, and under the Trading With the Enemy Act, 1939, the procedure will be as follows:

"Applications for the grant of patents, made by enemies, whether before or after the outbreak of war, will, where possible, be carried up to and including acceptance of the Complete Specification."

That means that only the examination of the application will be attended to. No patent will be granted, except in cases where an English manufacturer desires to obtain a license on the patent if issued:

The following is written in Article 3 of the Notice:

"As a rule, during the continuance of the war, patents will not be granted on applications made by enemies, whether alone or jointly with non-enemies. In cases, however, where it is shown that a person qualified under Section 2 of the Emergency Act intends to apply for a license under the patent if granted, the patent may be granted.

"Oppositions by non-enemies to applications for the grant of patents by enemies, and applications to the Comptroller by non-enemies for the revocation of patents may be filed and will, as far as possible, be communicated to the enemy applicant or proprietor as the case may be, and the question whether further proceedings should be taken on such a non-enemy opposition or application will be considered in each case in the light of the wishes of the parties and the public interest."

As to correspondence with enemies, notice is given by the Board of Trade that correspondence referring to patents, designs, copyrights and trade marks will be permitted in approved cases.

In Article 6 of the above-mentioned Notice a definition is given of the term "enemy":

"The term 'enemy' as used herein has

the meaning given to it in Section 2 (I) of the Trading With the Enemy Act, 1939, that is to say, it means:—

> "(a) any State, or Sovereign of a State, at war with his Majesty,
> "(b) any individual resident in enemy territory,
> "(c) any body of persons (whether corporate or incorporate) carrying on business in any place, if and so long as the body is controlled by a person, who, under this section, is an enemy, or
> "(d) any body of persons constituted or incorporated in, or under the laws of, a State at war with his Majesty; but it does not include any person by reason only that he is an enemy subject."

In France, according to the "Bulletin Officiel" of Paris, a Trading With the Enemy Act was invoked on September 1st, 1939. A decree of September 4th, 1939, provides for the sequestering of goods and rights belonging to the enemy, including those appertaining to patents. One of the objects of a decree of September 1st is to provide extension of time for conforming to certain legal acts, e.g., in connection with patent matters.

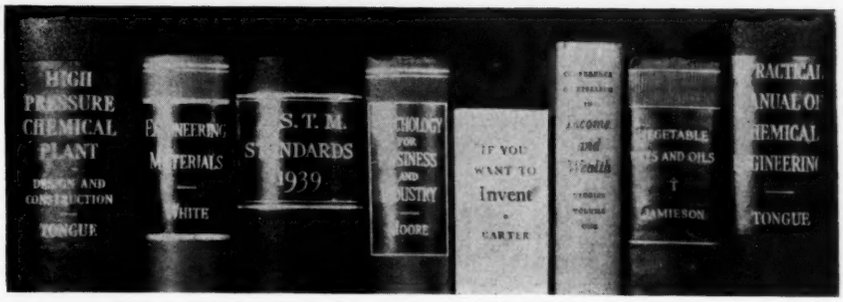
In France, too, correspondence with the enemy, although generally prohibited, will be permitted when necessary for the maintenance of patents, etc., and if reciprocity is provided (Decree of September 1st, 1939).

In Germany has been enacted a decree providing for the sequestration of goods and rights appertaining to the enemy (September 1st, 1939). Another decree was published under the same date concerning measures to be taken in regard to patents, designs and trade marks. This decree provides for a grace period of three months for the filing of amendments, paying of fees, etc. The publication of patent applications, after having been examined and accepted, may be prolonged for an indefinite period of time beyond the legal six-month period.

The right to claim priority under International Convention which legally expires one year after the filing of the first foreign application, is generally extended for a term of six months from publication of the law and may be further extended. It is provided, however, that foreigners may take advantage of these extensions only if their countries grant reciprocity.

One neutral country—Switzerland—has already enacted an extraordinary law (September 29th, 1939) extending certain delays for patents, designs and trade marks.

Citizens of the United States have thus far not been in the position of taking advantage of German facilities since the United States has no legal cause for granting reciprocity to German applicants. It will be advisable for citizens of this country interested in German patents to make their dispositions well within the legal time limitations.



The Industry's Bookshelf

Pyrotechny, by George W. Weingart; Chemical Publishing Co., N. Y. City; 170 pp., $5.00. Volume constitutes a revision of the author's Dictionary and Manual of Pyrotechny, published in '37. Well-arranged manual, with more fine color plates and sketches, certainly as interesting to the amateur as to the professional. Part I, entitled "Ingredients," is a guide to the grades and sources of supply of the basic raw materials needed for fireworks manufacture.

Lecture Demonstrations in General Chemistry, by Paul Arthur, Assistant Prof. of Chemistry, Oklahoma A. & M. College; McGraw-Hill Book Co., N. Y. City; 455 pp., $4.00. Complete manual for the lecture demonstrator, with over a thousand suggested experiments, each completely described for the greater practical use of the lecturer confronted with the problem of having to use a demonstration hall holding a large audience.

British Chemicals and Their Manufacturers, 1939; official directory of the Association of British Chemical Manufacturers, London, Eng. Excellent, 5-language commercial directory, listing manufacturers only. 276 pp. are devoted to the alphabetical listings of important industrial raw materials and chemicals, together with the names of the manufacturers; the following 106 pp. are an alphabetical listing of proprietary and trade names. About 70 hall, or trade marks, are included. This volume is of very handy size, and extraordinarily well arranged for maximum and quick usefulness.

Semimicro Qualitative Analysis, by Prof. Arthur R. Middleton, and John W. Willard; Prentice-Hall, Inc., N. Y. City; 446 pp., $3.50. The authors apply in this text modern physical chemistry to qualitative analysis. While not an elementary text, volume offers excellent laboratory material for a thorough-going course in up-to-date inorganic analysis that might well be followed by physical chemistry laboratory of more than average difficulty.

Qualitative Analysis by Spot Tests, by Fritz Feigl, and translated from the latest German edition by Janet W. Matthews; Nordemann Publishing Co., N. Y. City; 462 pp., $7.00. Second English Edition of this now generally accepted source work on spot analysis. The geologist, textile chemist, consultant, analyst, and works chemist will all find at least part (if not the whole) of this practical manual helpful in solving "routine" problems.

Rayon Handbook, 3rd Edition, edited by H. R. Mauersberger and Dr. E. W. K. Schwarz; Rayon Handbook Co., N. Y. City; 832 pp., $4.50. Enlarged, well illustrated, and complete encyclopedia and directory of the American rayon industry. This 3rd Edition is a distinct contribution to textile literature, and should be on the bookshelf of every chemist and chemical engineer.

Magnesium and Its Alloys, by P. L. Haughton and W. E. Prytherch, Chemical Publishing Co., N. Y., 100 pp., $1.50. Convenient synopsis of latest knowledge on the lightweight alloys—a timely little handbook of exceptional reliability.

Baking Powders, by Simon Mendelsohn, Chemical Publishing Co., N. Y., 178 pp., $4.00. The first modern and comprehensive treatment of leavening agents from both the lecturical and industrial points of view: an outstanding contribution in this field.

Fundamentals of the Petroleum Industry, by Dorsey Hager, McGraw-Hill, N. Y., 445 pp., $3.50. A brief, responsible interesting description of the oil business—history and economics blended with rare skill into a readable, usable work.

Titanium Pigments

By I. D. Hagar

In 1926, titanium dioxide production totaled only 5,000 tons. Within ten years the output went to 50,000 tons valued at twenty million dollars—it's still growing. The author is vice-president and general manager, Titanium Corporation, as well as manager of Titanium Pigments Division of Nat'l Lead Co.

FROM about 5000 tons of titanium dioxide in 1926, production in the succeeding decade increased to about 50,000 tons per year valued at about twenty million dollars. These estimates include titanium dioxide as such together with that contained in the composite pigments. Sales of titanium pigments were 1.6 per cent. of the total sales of all white pigments in 1925 and this ratio increased to 16.5 per cent. in 1934. *Statistics as to more recent years are not available but growth in titanium pigment production has continued as evidenced by expansions in plant capacities currently under way.

History

The element titanium was discovered in 1791 by the Rev. William Gregor, of the parish of Menachan in Cornwall, England. No attention was paid to the discovery until 1795 when Klaproth, in Austria, extracted and identified from what is now known as rutile, the element previously discovered by Gregor. He named the mineral "Titanic Earth," having reference to the mythological Titans, from which the name titanium was derived.

The first use of titanium compounds as pigments was about 1870 by Overton who mixed rutile with a bituminous vehicle for use as a resistant paint on ships' bottoms and by J. W. Rylands, a Birmingham varnish maker, who used powdered ilmenite ore as a black pigment. In 1893 Kidwell obtained U. S. Patent 503,424 covering a paint containing rutile. In 1908 the Norwegian government made researches for the purpose of finding a use for the large deposits of ilmenite occurring in that country. Titanium dioxide was separated (by means of sulfuric acid) and found to have high hiding power. However, it was not until 1915 in this country that L. E. Barton secured his patent covering the first chemically prepared, substantially iron free titanium pigment.

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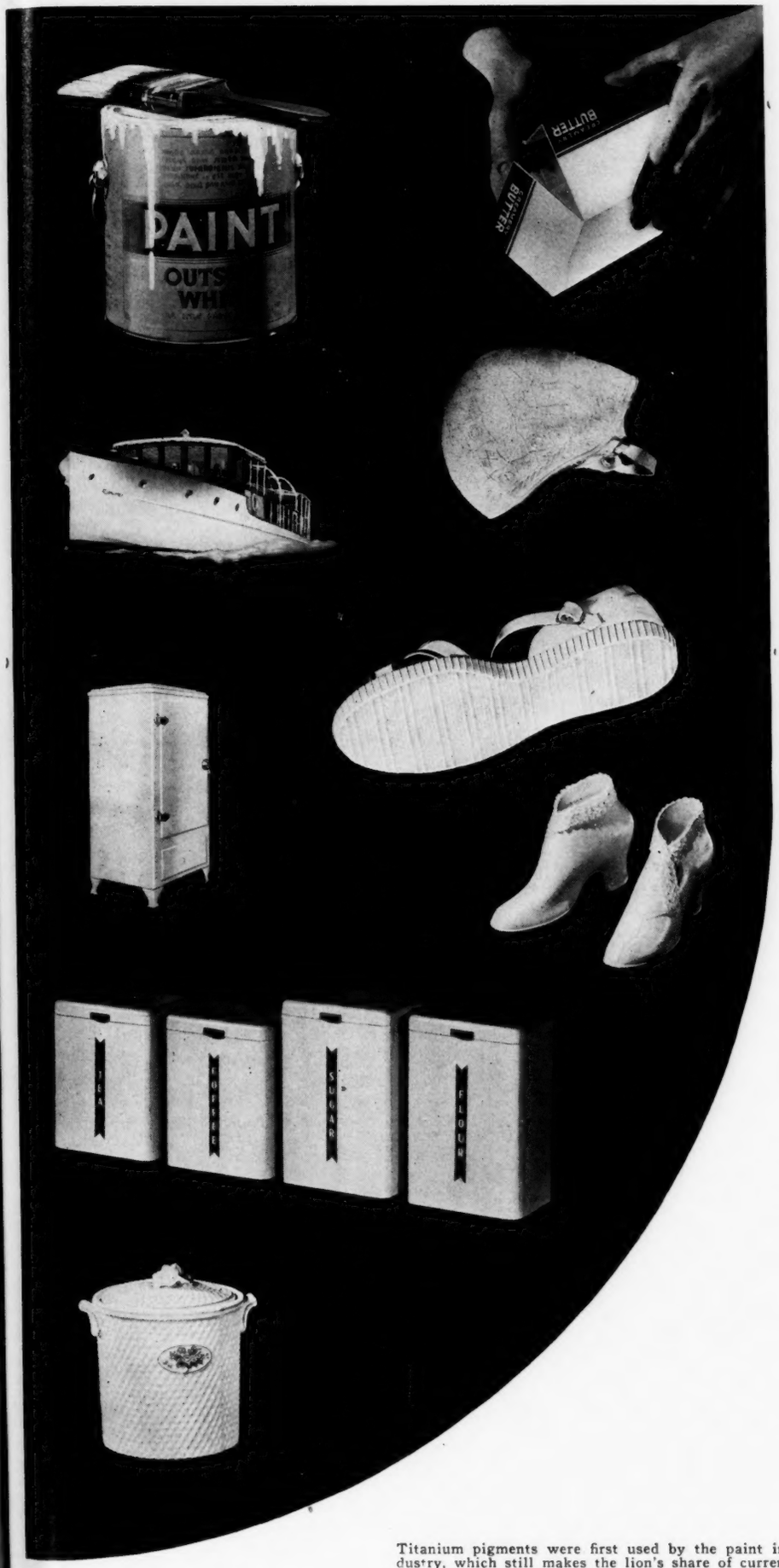
* Bur. Mines Information Circular No. 6881. Fig. 2 (April, 1936).



Titanium pigments were first used by the paint industry, which still makes the lion's share of current production. However, a glance at the items shown above tell a story of new uses which are keyed to the growth of titanium production.

In 1916, two companies, Titanium Pigment Co., Inc., of the United States, and Titan Co., A/S, of Norway, were organized for the manufacture of titanium pigments. The National Lead Co. acquired control of the Titanium Pigment Co., Inc., in 1920, and of Titan Co., A/S, and the Société Industrielle du Titane of France in 1927. Titan Co., Inc., then was organized to include the foreign interests of National Lead Co. The I. G. Farbenindustrie A.-G. entered the group through the Titangesellschaft m.b.H. as did, at a later date, Imperial Chemical Industries, Ltd., through British Titan Products Co., Ltd. A Japanese affiliate of Titangesellschaft m.b.H., Titan Kogyo Kabushiki Kaisha, has most recently been included with a plant which started operations in 1938. A Canadian affiliate, Canadian Titanium Pigments Co., Ltd., also has been organized. Titanium Pigment Co., Inc., became wholly-owned by National Lead Company in 1932, and in 1936 manufacturing was taken over by National Lead Co.—Titanium Division—and sales by Titanium Pigment Corp. In view of the potentialities of the titanium pigments, E. I. du Pont de Nemours and Co., The Glidden Co., and Interchemical Corporation also have entered into their production.

The first titanium pigment commercially produced in 1916, was a composite pigment containing 25 per cent. titanium dioxide and 75 per cent. blanc fixe and was sold under the name of "TITANOX"-B. This was followed, in 1925, by a calcium base composite pigment (30% TiO_2 --70%$CaSO_4$) "TITANOX"-C, and the pure titanium dioxide "TITANOX"-A. In 1935 lead titanate, $PbTiO_3$, was introduced to the paint trade as "TITANOX"-L.

Manufacture

Titanium is found in relatively concentrated ore bodies and deposits as the minerals ilmenite, rutile, and sphene. Of these, only ilmenite has been found to be economically suitable. Ilmenite, a ferrous titanate, $FeTiO_3$, frequently associated with magnetite or rutile, is the universally used source of titanium, since it can be converted directly into soluble iron and titanium sulfates by means of sulfuric acid. The sand deposits of the Travancore coast of India, the ilmenite concentrate of which contains 52-60 per cent. TiO_2, and the massive ore bodies at Egersund, Norway, yielding a concentrate of 44-48 per cent. TiO_2, are the most important deposits being worked at the present time.

The bulk of the titanium pigments manufactured in the United States have been and are produced from imported ilmenite ores. For this reason the imports of ilmenite illustrate clearly the growth of the titanium pigment industry. The table (Table I), which appears in an

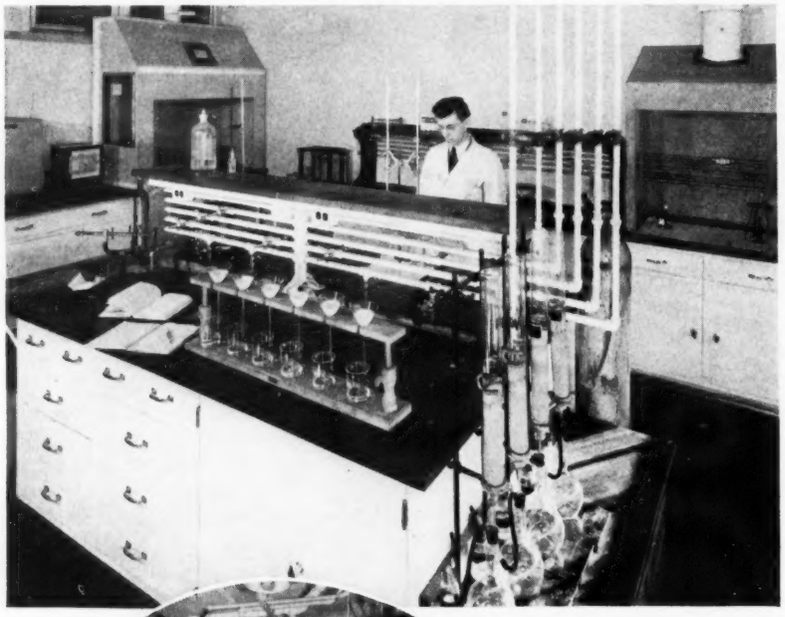
adjoining column, gives ilmenite imports in tons and their value during recent years.

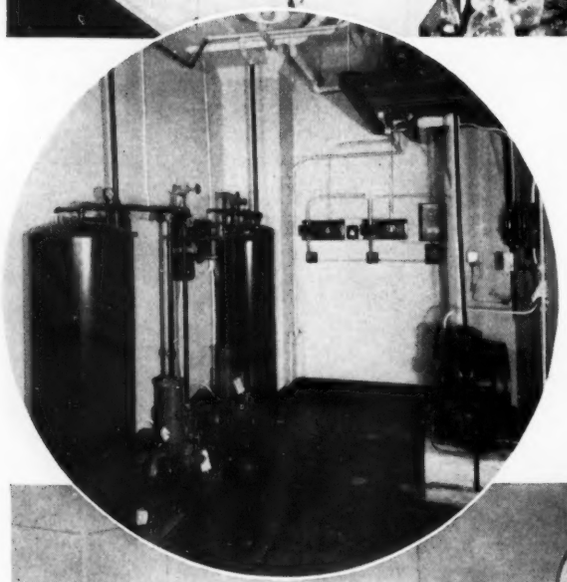
All processes for the manufacture of titanium pigments which have been commercially successful to date involve the thermal hydrolysis of sulfuric acid solutions of titanium.

In the process of manufacture the titanium ore concentrates are first pulverized to a fine powder and then treated with concentrated sulfuric acid. A violent reaction takes place resulting in the formation of a mixture of titanium and iron sulfates. These sulfates are taken up in water and passed through a series of settling and washing tanks in which the insoluble impurities are removed. The clarified solutions are then adjusted to a definite concentration with respect to titanium, iron and sulfuric acid content and pumped to storage tanks.

Table I†

Year	Long Tons	Value
1932	33,491	$231,652
1933	38,610	196,211
1934	71,710	356,208
1935	119,922	636,293
1936	127,446	697,822
1937	153,971	771,140
1938	201,545	1,018,430

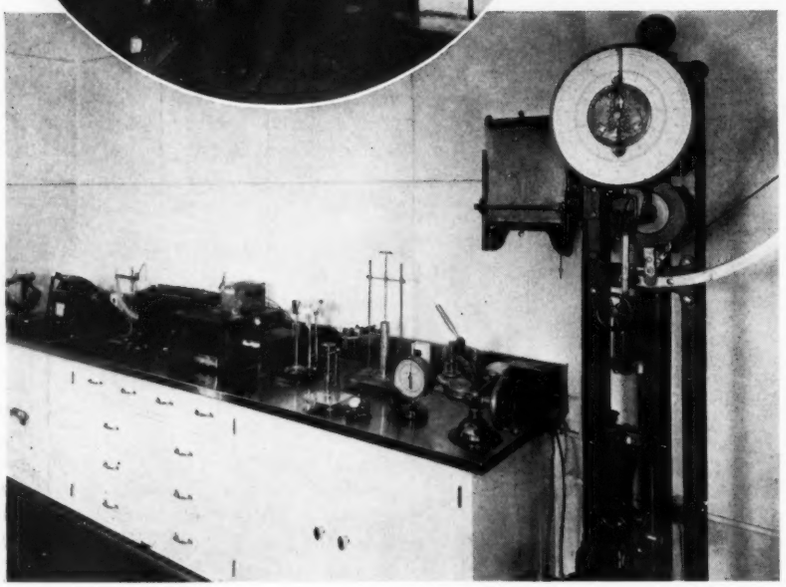




Above—Close laboratory control during each stage in the manufacture of titanium pigments assures users of a high degree of uniformity.

Left—Pressure, vacuum, air conditioning apparatus in laboratory.

Below — Constant temperature and humidity room where pigments are tested.



Blanc Fixe, which serves as the base in "TITANOX"-B, is prepared by roasting pulverized barytes ore with powdered coal and then leaching out the soluble barium sulfide thus formed. From this solution the barium sulfate is precipitated by the addition of sodium sulfate. The precipitated sulfate is thoroughly washed and then stored in the form of a paste or sludge. The sodium sulfide is recovered from the precipitation, concentrated and sold as a by-product.

Calcium Sulfate, which is used as a base in "TITANOX"-C, is prepared by treating lime or pulverized limestone with sulfuric acid under carefully controlled conditions to obtain the desired properties in the finished composite pigment.

For the production of the composite barium and calcium base pigments, a definite quantity of the titanium sulfate liquor is pumped to a precipitating tank. The requisite amount of either barium sulfate or calcium sulfate in pulp form is suspended in the solution and the titanium is then precipitated upon the respective base by hydrolysis at the boiling point. After precipitation is completed the composite mass is thoroughly washed, partially dehydrated, then calcined at a temperature approximating 1550° Fahrenheit. It is then disintegrated and packed either in bags or barrels.

In the production of "TITANOX"-A (Titanium Dioxide), the processes are essentially the same except that no inert base is employed at the time of precipitation. The calcined titanium dioxide is wet-milled and water floated to insure uniformity of particle size.

"TITANOX"-L, which chemically is lead metatitanate ($PbTiO_3$), is made by controlled calcination of a mixture of litharge (PbO) and purified, hydrous titanium oxide. Rigid control of the calcination process is practised in order to accomplish a complete combination of the litharge with the titanium dioxide, and to develop optimum pigment properties of the lead titanate.

† Minerals Yearbook *1938* and *1939*, U. S. Bur. Mines.

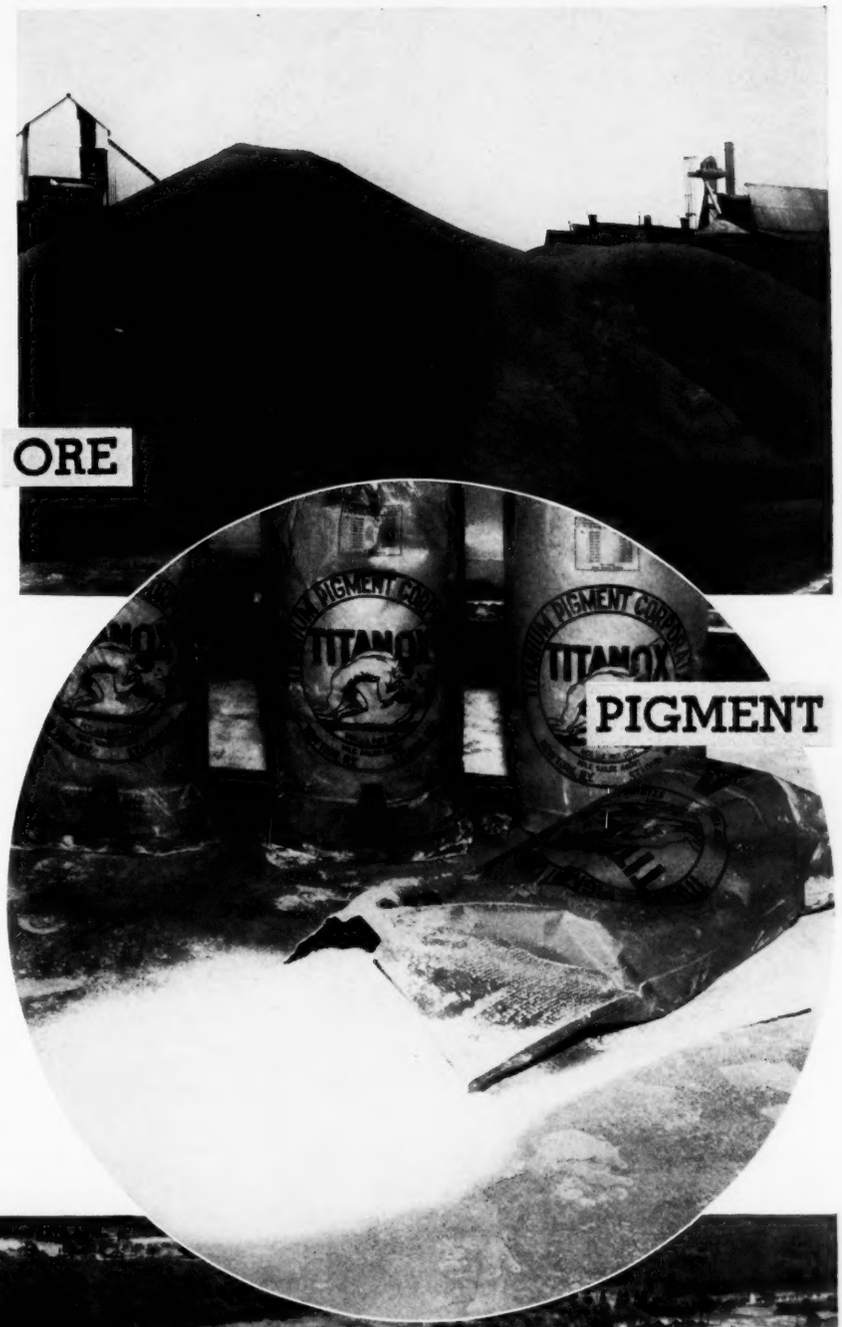
Uses

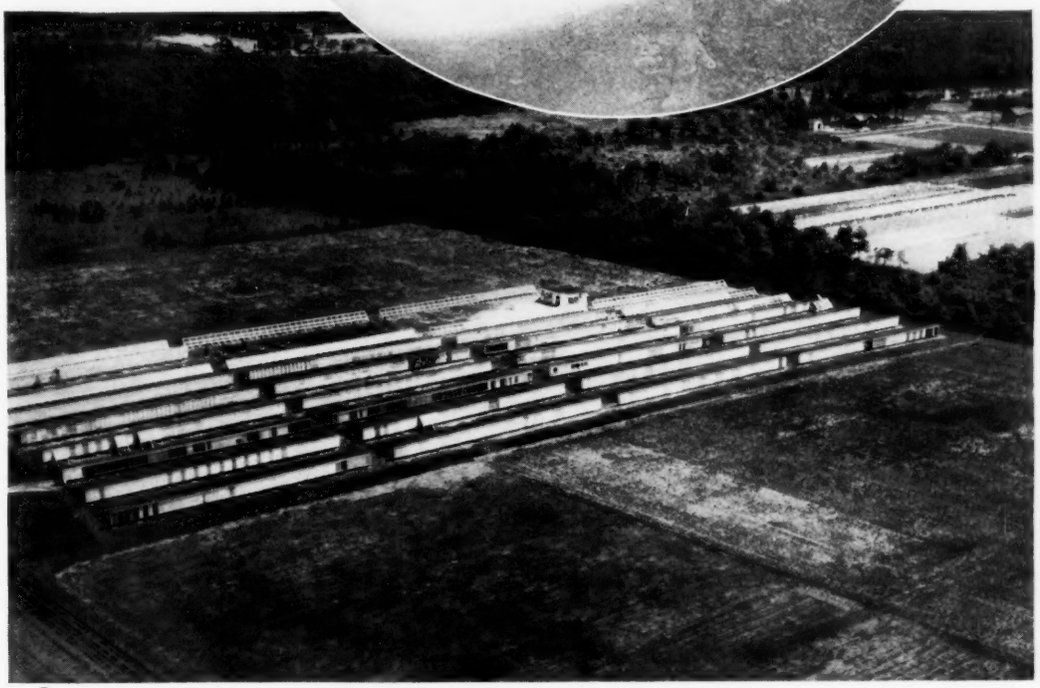
The titanium pigments serve as raw materials for the protective and decorative coating industries, as well as the paper, rubber, cosmetic, rayon, and other industries; the first of these representing the bulk of the consumption.

Protective and decorative coatings

The titanium pigments have outstanding qualities which led to their rapid adoption as valuable white pigments by the protective and decorative coating industry. Perhaps the most striking quality is their high opacity or hiding power. This is most clearly demonstrated in Tables II and III, listing the tinting strength and hiding power of various white pigments and the cost to hide 1000 square feet of black surface.

The titanium pigments are chemically inactive and consequently they may be used with practically all types of reactive vehicles without danger of thickening or livering. The titanium pigments have a high whiteness or brightness (titanium dioxide has a total light reflectance of 99% (MgO = 100%)). Because of this high total brightness they produce clear color tones free from muddiness or objectionable undertone when used in a tinting base. When used in exterior paints, the titanium pigments impart great hiding power and tend to prevent checking, cracking, and scaling of the exposed paint films. Because of their non-reactivity with oil vehicles, titanium pigments when used in exterior finishes are always formulated with pigments of the active type, such as basic carbonate white lead, basic sulfate





This battery of fences at Sayville, L. I., enclose nothing. Their rôle is that of guinea-pig for "Titanox" pigmented paints. Paints are applied to their surfaces and remain exposed to outdoor weather conditions as test for paints.

Above—The newest plant of Titanium Pigment Division, National Lead, at Sayreville, N. J., on the Raritan River.

Left—Midwest plant for manufacture of "Titanox" pigments located at St. Louis, Mo., which began operations in 1923.

white lead, leaded zinc oxide, or zinc oxide. If properly formulated, paints made with titanium pigments leave the surface in excellent condition for repainting.

The barium and calcium composite pigments range in particle size up to one micron, the mean diameter being about 0.5 micron; while the mean diameter of titanium dioxide is about 0.3 micron.

The titanium pigments, and more especially the titanium-barium pigments, have been widely adopted for use in the formulation of exterior house paints. There are three types of pigment combinations which have found considerable popularity. These are titanium-zinc combination paints which, because of their resistance to hydrogen sulfide gases and fumes, are adapted for use in industrial areas where such gases occur; titanium-lead-zinc paints for use in general house painting; and titanium-white lead combinations for use as house paint primers and specialized finish coat paints.

Table II

Tinting Strength and Hiding Power‡

	Tinting Strength	Hiding Power Sq. ft./lb.
Basic Lead Sulfate	85	13
Basic Lead Carbonate	100	15
Zinc Oxide (35% Leaded)	170	20
Zinc Oxide	200	20
Lithopone	260	27
High Strength Lithopone	400	44
Titanated Lithopone	400	44
"TITANOX"-B (Titanium-Barium Pigment)	430	46
"TITANOX"-C (Titanium-Calcium Pigment)	450	48
Zinc Sulfide	540	58
Lead Titanate	570	60
"TITANOX"-A (Titanium Dioxide)	1150	115

‡ See Proc. Am. Soc. Testing Materials *1930*, Pt. II, pp. 895-902 for methods for determining these values.

Table III

Hiding Power Cost to Cover 1000 *Square Feet over a Black Surface*

Basic Lead Sulfate—76.9 lbs. at 6¼ cents	$4.81
Basic Lead Carbonate—66.7 lbs. at 7 cents	4.67
French Process Zinc Oxide (Green Seal)—50 lbs. at 8 cents	4.00
American Process Zinc Oxide—50 lbs. at 6¼ cents	3.13
Zinc Oxide (35% Leaded)—50 lbs. at 6 cents	3.00
Lead Titanate—16.7 lbs. at 10 cents	1.67
Lithopone—37 lbs. at 3 6/10 cents	1.33
Zinc Sulfide—17.2 lbs. at 7½ cents	1.29
"TITANOX"-A (Titanium Dioxide)—8.7 lbs. at 13 cents	1.13
High Strength Lithopone—22.7 lbs. at 5 cents	1.13
Titanated Lithopone—22.7 lbs. at 5 cents	1.13
"TITANOX"-B (Titanium-Barium Pigment)—21.7 lbs. at 5¼ cents	1.13
"TITANOX"-C (Titanium-Calcium Pigment)—20.8 lbs. at 5 cents	1.04

Lead Titanate

Recently lead titanate has been introduced for use in tinted bases having exceptional durability and freedom from the most common types of paint failures, namely, cracking, flaking, and scaling.

The titanium-calcium pigment has distinctive properties and characteristics which lend themselves to flat wall paint formulation for the economical attainment of a greater number of desirable qualities than had heretofore been possible in a single paint. It is characterized by high opacity, chemical stability, low specific gravity, and easy dispersibility. These pigment properties translate into the desirable flat paint properties, respectively, of hiding, uniformity, economy and facility in mixing and grinding. They also are char-

acterized by a high light reflectance, non-yellowing, and brilliant tints.

While finding its initial acceptance in flat wall paint formulation, titanium-calcium pigment has been improved in its characteristics and the same pigment is now employed in the formulation of interior gloss enamels.

While pure titanium dioxide pigment may be added to all types of formulations to increase hiding power without materially affecting other properties, it probably finds its greatest application in industrial and automotive finishes, and is particularly suitable for baking type enamels. The small amount necessary to provide adequate hiding power in enamels, especially those of the nitrocellulose type, contributes materially to improvement with respect to elasticity, continuity of film and high gloss in such products. Its non-reactivity makes it particularly valuable in phenol-formaldehyde or alkyd resin vehicles.

Industrial Finishes

In the field of industrial finishes, a long felt requirement for a single pigment with both high hiding power and resistance to chalking is being met by a grade of titanium dioxide, treated with antimony oxide in the process of manufacture ("TITANOX"-AA). Experiences with this pigment indicate that it is especially suited for use in automotive finishes and other industrial coatings as well as in exterior paints.

Paper

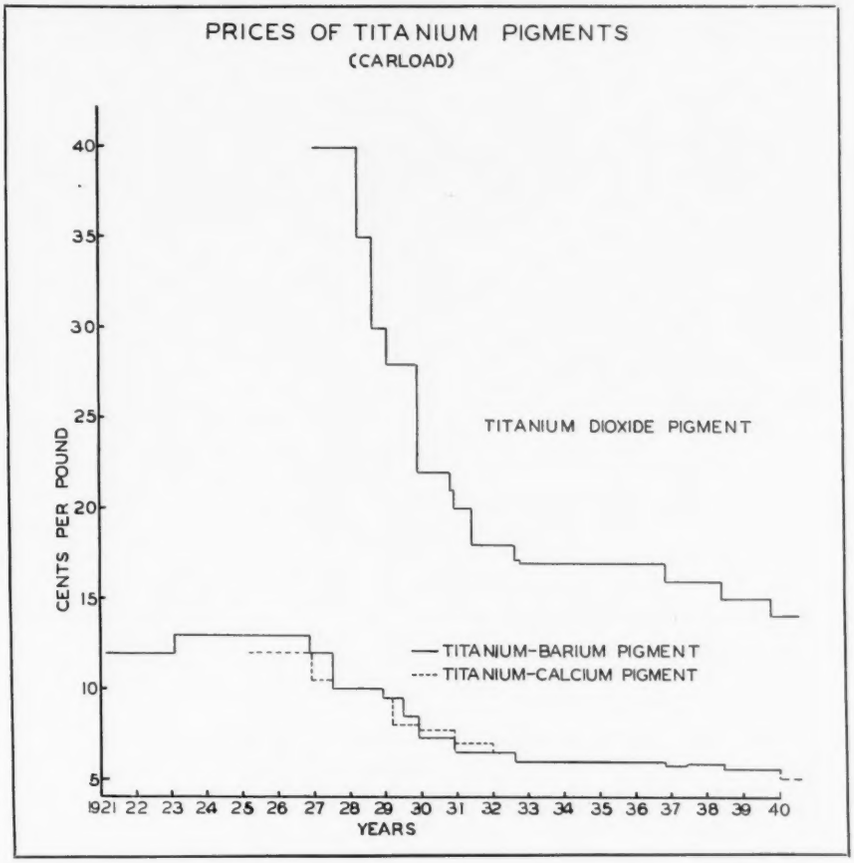
The titanium pigments offer a logical means of improving the opacity, color, and brightness of paper with a minimum of loading material. They are suitable for use as a beater addition, as a surface application, or in the coating mix. Titanium pigments are readily retained by paper pulp which permits of their efficient use as beater fillers. Their dispersibility and suspension in starch, glue and casein solutions facilitate their use in surface sizing or coating mixes.

Rubber

The titanium pigments, more particularly the titanium dioxide and the titanium-calcium pigments, are used in the compounding of white and tinted rubber stocks. Their chemical inertness, fine particle size, and high opacity lend themselves to all types of rubber formulation.

Cosmetics

In addition to its aforementioned properties of chemical inertness and high opacity, titanium dioxide is non-toxic and non-irritating. Therefore, as a pigment, it is finding increasing use in white soaps, one per cent. generally giving a decided improvement in appearance. Relatively small percentages are advantageously incorporated in face powders, creams, skin lotions, depilatories, etc.



Leather

White pigments are used in the drumming of wet skins to produce the white and light tinted leathers. The titanium dioxide and titanium-barium pigments are well adapted to such use. These same pigments are also extensively used as the pigmenting agents for white shoe dressings whether of the paste, cream or liquid type.

Rayons

Synthetic yarns as originally produced had an objectionably high luster. Delustering is accomplished by dispersing a pigment in the viscose solution prior to spinning, thus incorporating the pigment within the rayon filaments. Titanium dioxide is fitted for this application because of its chemical inertness, fine particle size, and good dispersion in the viscose solution thus avoiding clogging of spinnerettes or weakening of the filaments. The high opacity of titanium dioxide permits the use of relatively small percentages of pigment to effect even complete delustering if such is desired.

Miscellaneous

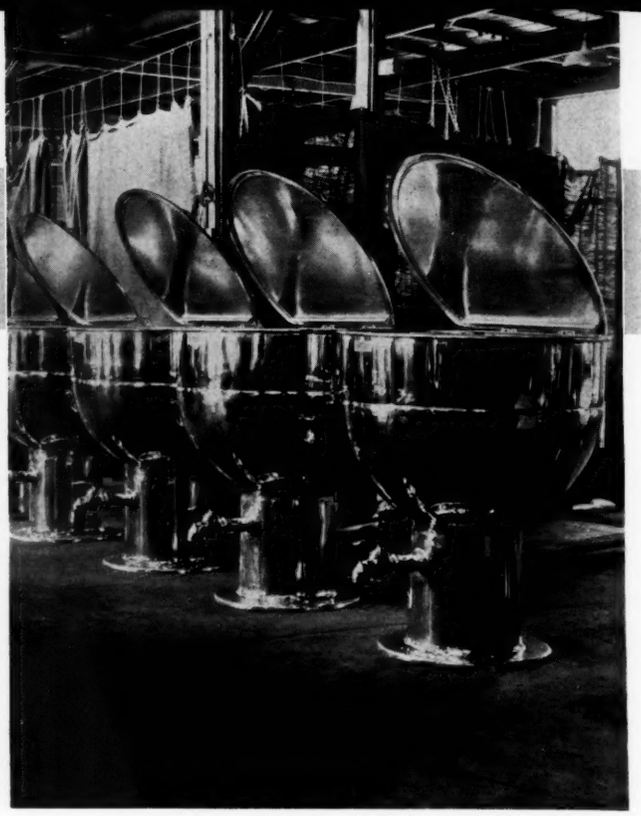
The titanium pigments may be used advantageously wherever a white pigment is required. Their chemical inertness makes them adaptable to many uses. Titanium dioxide also finds specialized uses other than as a pigment. It is used in coated welding rods in which it serves to stabilize the arc; also, although only to a minor extent, as an opacifier in vitreous enamels and, more importantly, to increase their acid resistance.

While not an outlet for titanium pigments it may be mentioned that titanium alloys are used in the manufacture of alloy steels usually as ferro-carbon-titanium. Formerly employed almost exclusively as a deoxidizer, it has recently begun to be important in the manufacture of rustless steels to inhibit intergranular corrosion. In the production of intermediate steels, ferro-carbon-titanium may displace more expensive alloys, notably nickel and vanadium.

Prices

As consumption of the titanium pigments has grown since their introduction as chemical raw materials, increased production thus made possible, together with improvements and economies in manufacturing processes, have decreased production costs. These cost reductions have been translated into lower prices to the consuming industries as illustrated in the accompanying graph. The titanium-barium pigment has decreased in price from 12 cents per pound in 1921 to 5¼ cents per pound currently; the titanium-calcium pigment from 12 cents per pound on its introduction in 1925 to 5 cents; the pure titanium dioxide from an initial price in 1927 of 40 cents per pound to 13 cents today. These quotations are for carload quantities.

Twenty Years of



Stainless steel steam jacketed kettles are used in large numbers in pharmaceutical, chemical and food processing plants.

THE first section of this article described the main advances achieved by the steel industry during the past twenty years in equipment, in scientific knowledge of the processes involved in steel making, and in the quality of plain carbon steels. It also briefly discussed the low alloy and the plain chromium high alloy steels. This section will similarly describe the more complex high alloy steels, the tool steels, and cast iron.

The chromium-nickel steels now in greatest use contain from 17 to 20% chromium, 8 to 10% nickel, and carbon up to 0.12%. They come within the category popularly known as "18-8", although frequently modified for specific uses by manganese, molybdenum, tungsten, silicon, titanium, columbium, copper, and other elements. Commercialization of the 18-8 steels began in this country as recently as 1926. It is indeed difficult to realize that a material which has taken so large a place in our lives is of such recent advent.

These austenitic (single-phase structure), non-magnetic steels possess greatest ductility and softness when quenched from between 1000° and 1150° C. Even in this fully softened condition they have remarkable mechanical properties, tensile strengths varying between 75 and 100 thousand pounds per square inch, elongation up to 65%, and reduction of area up to 70%, all according to composition. Such steels are amenable to practically all the fabricating operations employed with plain carbon steels. By cold-working, the tensile strength may be increased to 150 thousand pounds per square inch without materially reducing the resistance to corrosion. Additional cold work still further increases the tensile strength up to about 300 thousand pounds per square inch. Corrosion resistance diminishes somewhat as the strength of the steel is increased by cold work, as does the ductility. However, the extent of loss of properties is not serious for many uses and a considerable tonnage of wire and cable is produced, which serves many useful purposes from airplane struts to boat rigging.

It was early observed that the highest strength cold-rolled 18-8 steels have a relatively low proportional limit and a yield strength not readily predetermined, points of considerable importance when designing light-weight, high-strength structures. Recently a great enhancement in these properties has been accomplished by simply warming the steels to about 200° C.; the proportional limit has been approximately doubled, the yield strength has been appreciably raised, and the modulus of elasticity can be definitely determined. No loss of corrosion resistance results from this heat treatment.

Shortly after the industrial introduction of the 18-8 steels, difficulties were encountered in welded structures subjected to corroding media. The difficulty comprised loss of strength and ductility and was named "weld decay." This phenomenon is now generally known as intergranular corrosion and has even been observed in pierced tubing employed for long periods at high temperatures. It occurred only in steels which had not been quenched or rapidly cooled from a suitably high temperature; for example, next to a weld in a vessel that could not be heat treated after fabrication or in vessels operated at temperatures between 400 and 600° C. The addition of titanium or columbium to low carbon 18-8 steels has eliminated this difficulty so that today welding can be freely employed and the vessels used at any reasonable temperature if 18-8 suitably modified by one of these elements is chosen.

Molybdenum additions from about 1.50% to approximately 3% increase considerably the corrosion resistance to non-oxidizing media and are rapidly finding use in process industries.

Several more highly alloyed chromium-nickel steels are being employed to meet special conditions. As typical examples in which chromium predominates may be mentioned the 25% chromium-12% nickel, 25% chromium-20% nickel, and the 29% chromium-9% nickel compositions. The last mentioned is obtainable only in the form of castings, including tubular products up to 16 inches in diameter cast centrifugally; it is especially useful in the presence of high sulfur combustion gases under reducing conditions at high temperatures. Nickel predominates in other varieties, of which the 35% nickel-15% chromium composition is a good example. These types of steel not only possess great strength at high temperatures, but are also non-scaling at higher temperatures than the 18-8 class of steels.

About a decade ago there was developed in this country an important series of predominantly austenitic steels which contains approximately 18% chromium and 8% manganese, or a similar amount of chromium with manganese and nickel. Although these compositions are stainless steels, they have not been commercialized to an appreciable extent in this country. In Europe, however, they have met with considerable application.

In some instances of mild corrosion, or where protection of the purity of product is the main consideration, a vessel with a surface or coating of stainless steel will serve the purpose equally as well as a solid vessel. Many large pieces of equipment have been lined for such service by welding and other means. However, there has long been a desire for thoroughly bonded bi-metal units for construction in this field. Many early attempts failed or were only moderately successful, but recently both practical and economic success has been achieved. Much progress may be expected in the future from these cladded steels, and their economy will doubtless further expand the use of stainless steel.

On account of the relatively high strength at ordinary and high temperatures, excellent values for creep strength at elevated temperatures, ductility, general fabricating characteristics and weldability, taken together with the resistance to a large variety of corroding media of the 18-8 and more highly alloyed chromium-nickel steels, the chemical industry has been

ALLOY STEEL

By JAMES H. CRITCHETT

Vice-President,

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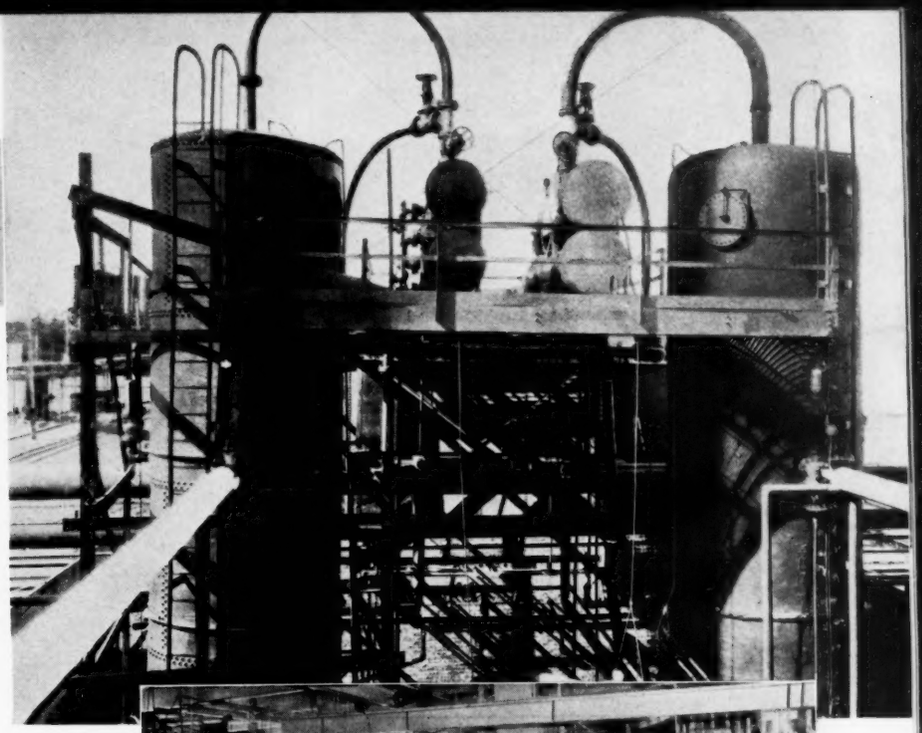
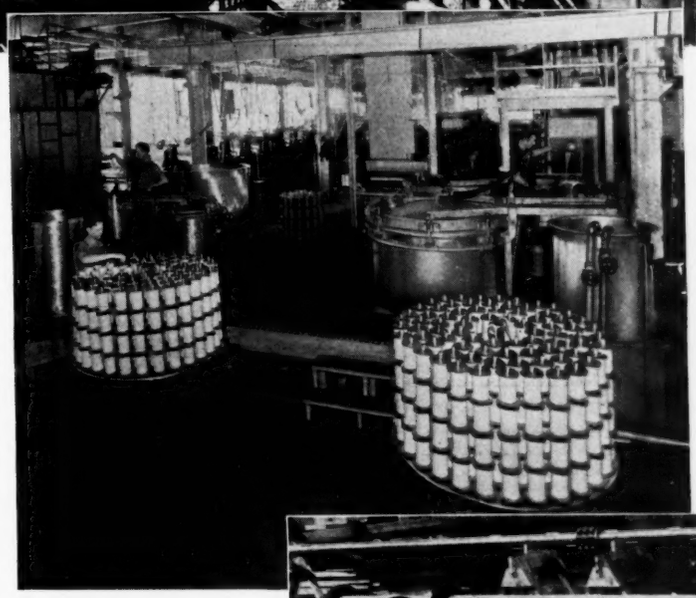
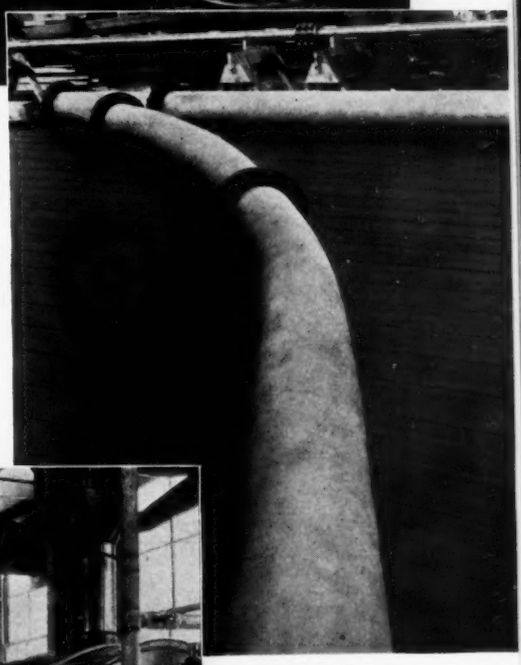
Part II

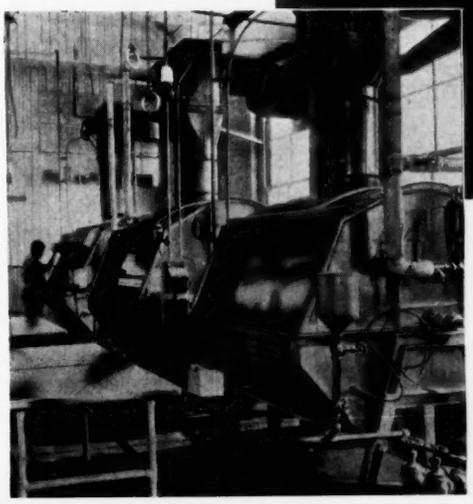






Top—The use of high-chromium stainless steels in this oil refinery equipment permits operations at high temperatures and pressures under corrosive conditions.

Above—Several hundred spools of cotton yarn are processed at once in stainless steel package dyeing machines.



Above—A small percentage of columbium in this 18-8 paper mill piping insures the retention of corrosion-resistance after hot-forming operations.

Left—After long service these stainless steel perforated cylinders in rotary dyeing machines are free from corrosion and discoloration.

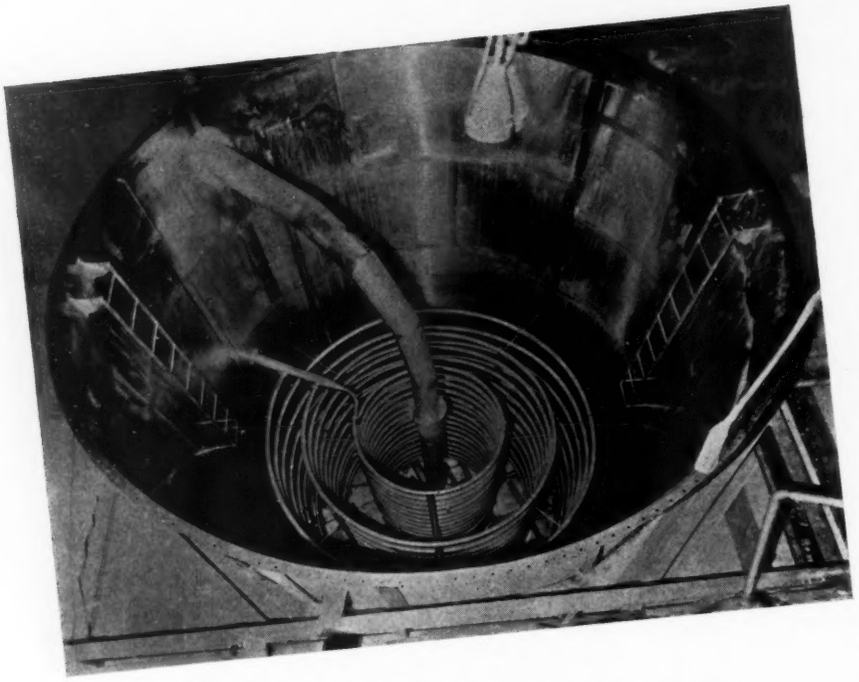
able to operate old processes at higher temperatures and pressures and to utilize new processes which could not have been commercialized had stainless steel not been available.

Stainless steels have found use in one place or another in almost all chemical manufacturing plants. Owing to the limitations of this article only a few major examples may be briefly cited.

The petroleum industry has long encountered corrosion difficulties; but during the past twenty years, as a result of the need for increased efficiency in gasoline production, the adoption of entirely new processes coming from greatly augmented research, and the use of crude oils of higher sulfur contents, corrosion problems have become more varied and decidedly more critical. This industry is one of the largest users of stainless steels and it probably employs the widest variety of corrosion-resistant steels, ranging from oil still tubing and other equipment of the 4 to 6% chromium type to the more highly alloyed steels containing up to 30% chromium and 20% nickel for that equipment requiring the optimum combination of strength, resistance to corrosion and scaling at high temperatures. The high temperatures and pressures involved in the hydrogenation of oil particularly necessitated the use of non-scaling materials having high strength, high creep strength, and resistance to corrosive attack. Highly alloyed chromium-nickel steels (25% chromium-20% nickel for example) are indispensable in the commercial operation of this process.

One of the industries early to use the highly alloyed chromium-nickel steels is the sulfite pulp and paper industry. It is an excellent example of the application of corrosion-resistant steels in an industry selling a cheap product under highly competitive conditions. The chromium-nickel steels have made possible introduction of the circulating and hot acid systems in the making of sulfite pulp, which operating methods are important economic contributions. As of recent years a great part of the equipment in sulfite mills is of stainless steel. Digesters are still a problem insofar as stainless steels are concerned, but there is much hope for the future by the use of the chromium-nickel steels which have been improved through addition agents so that they do not require heat treatment after welding into large structures. Molybdenum additions to the highly alloyed chromium-nickel steels increase corrosion resistance to most of the chemicals handled in the paper industry.

The sulfate (kraft) paper industry was more hesitant than the sulfite pulp industry in replacing old equipment with stainless steels. On the other hand, during the past decade many kraft pulp mills have been constructed and advantage



This 38,000 gallon yeast propagator tank and 1,000 foot attemperator coil used in the brewing industry was constructed of stainless steel.

has been taken of the valuable properties possessed by the chromium-nickel steels, particularly the 18-8 variety.

The soap industry also finds use for the stainless steels in many applications. Insofar as straight soap making is concerned the chief advantage is the production of higher quality soaps. However, the soap industry has greatly diversified its products, chiefly through the hydrogenation of fatty acids. Relatively high temperatures and pressures are employed in these hydrogenation processes, and steels of the 18-8 class are giving satisfactory results.

Pharmaceutical products have increased in variety at a greatly accelerating rate during recent years. New processes have been developed which require high temperatures, very low temperatures, and in some instances high pressures. Operations under these conditions are frequently conducted in the presence of strongly corroding media. Purity and stability of products are prime considerations. Stainless steels (chiefly 18-8) truly have been welcomed in this industry. The different types of equipment in which these steels are used are innumerable.

The dyeing industry found many uses for stainless steels. Age-old difficulties with wooden vats which necessitated long "boil-outs" with each change of color or shade gave an interesting starting point to effect great economies. In some instances ten or more wooden vats were replaced by a single vat of stainless steel, resulting in improved uniformity and higher purity of product. Much other equipment in the dyeing industry is exposed to corroding media, and this is especially true of the textile industry as a whole. Numerous alloys are used, but stainless steels are being increasingly employed. Advantage is taken of stainless steels in the rayon and more recently developed synthetic fiber industries. The 18-8, both plain and modified with molybdenum, predominate.

The brewing industry has found wide application for the stainless steels, including in some instances the construction of entire units. Experience has shown that the color, flavor and body of the beer are unaffected.

The avoidance of bacterial contamination of milk and other products of the dairy industry has been a problem that does not require description. Soon after 18-8 had been placed on the market and some elaborate tests had been completed, the dairy industry became very enthusiastic over the use of this steel, owing to its insolubility in milk and resistance to the strong chemical cleaning and purifying solutions used in dairy plant operation. The excellent mechanical properties also added to the appeal. Today, many thousands of farmers employ stainless steel cream separators and other equipment so that they may meet the rigorous specifications for purity. A large number of milk receiving stations and pasteurizing plants use stainless steel throughout the installations—indeed, in more than one plant the cows are milked mechanically with stainless steel apparatus and the milk flows through the sterilizers and other equipment until it finally reaches the bottles without coming in contact with any other metal than stainless steel.

One of the early applications of 18-8 in this country was in milk truck tanks. Later this construction was embodied in the trailer types and finally in railway tank cars of 18-8 stainless steel for the shipment of milk.

The uses of stainless steel in the food processing industries are so diversified that particularization cannot here be attempted. Suffice it to say that the food industry taken in all its ramifications is one of the largest users of stainless steels. The 18-8 type is most largely employed.

Much has been said in the foregoing concerning stainless steels. The author believes this is merited. Within the past twenty years, taking into consideration the total cost of fabricated products as they are delivered to the user, the business in all its aspects has grown so that it runs into the hundreds of millions of dollars.

The chemical engineer is doubtless familiar with much that has been said about the use of stainless steel in the chemical industry. Likewise he cannot have failed to see many examples of the use of that steel for architectural purposes. Its pleasing color, permanence, and ease of cleaning explain its use in this field. He may not appreciate to as great an extent the large and growing use of stainless steel in light-weight construction, such as trains and buses, where the very high strength that can be given to these steels by cold rolling and the ease with which they can be fabricated are fundamental reasons for their choice. However, these properties would be of little value were it not for the permanence afforded by the corrosion resistance, which makes unnecessary added thickness and weight to provide against the ravages of time.

Tool Steels

Tool steels play a most important part in all industry, since they are the means through which raw steel is shaped and finished into machines and apparatus with which practically all products are manufactured. In general they fall into two categories. The first comprises ordinary or plain carbon tool steels such as knives, chisels and certain rock bits which operate so that little heat is generated, and hardness and toughness are the chief requisites. Such tool steels have benefited greatly by the general improvement in carbon steel quality, which was described in the first section of this article. Tool steels of the second class are used for the machining of cast iron, steel and other metals, and in operation great heat is generated at the point of the tool. Consequently they must not only be capable of being hardened but must hold that hardness at high temperature. Indeed, modern high speed cutting tools continue to cut with the point of the tool glowing. It is in this class of tools that the greatest advance has been made recently.

High speed tool steel came into indus-

trial being at about the turn of the century. The most common variety contains about 18% tungsten, 4% chromium, and 1% vanadium. Several important improvements have been brought about in this basic analysis. Addition of cobalt up to 12% and increase of vanadium up to 5% have produced superior quality capable of retaining hardness at higher temperatures, that is, at higher cutting speeds. Substitution of part of the tungsten with molybdenum has added another type, affording improved economy under some conditions.

Improvement of the basic high speed steel has been of great importance, but of even more far-reaching consequence has been the introduction of entirely new alloys for cutting tools. These have supplemented high speed steel and enabled manufacturers still further to increase the speed and lower the cost of machining. The first of these was Stellite, an iron-free cobalt-chromium-tungsten alloy. The composition of Stellite is such that it is not affected by heat treatment, and it cannot be forged; hence it is cast and ground to shape. With it cutting speeds on many operations were increased one hundred per cent. or more, and when used at a lower cutting speed the life of the tool was correspondingly lengthened.

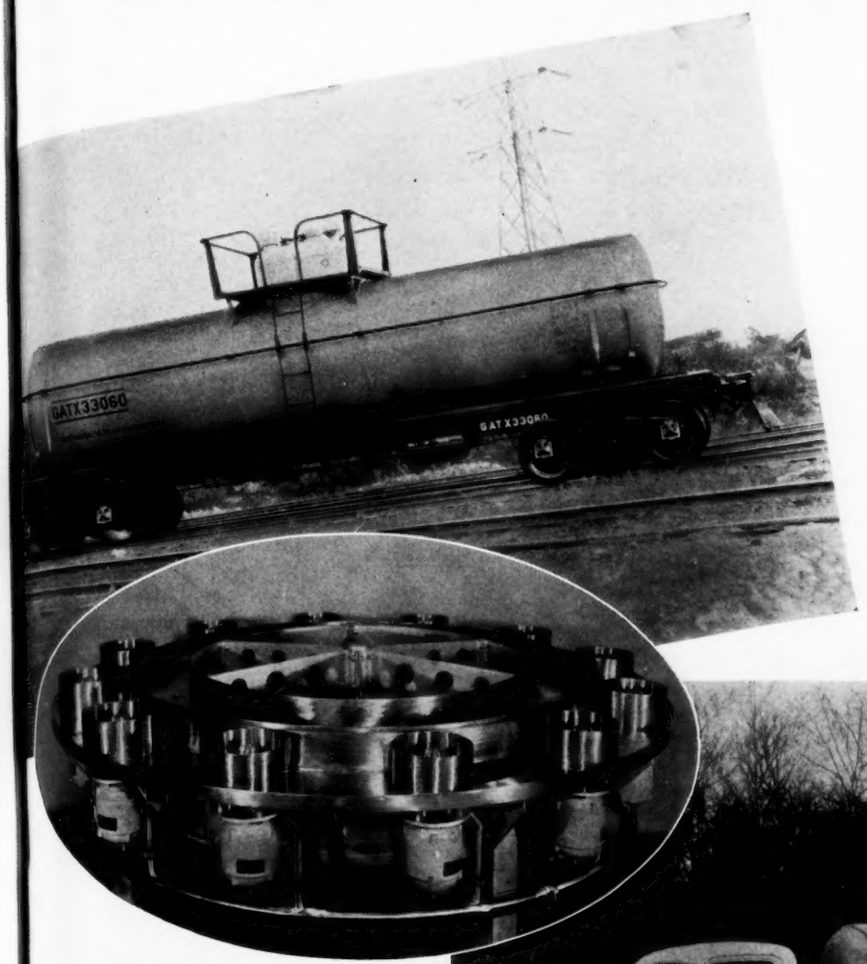
Stellite was followed and supplemented by tools of sintered tungsten carbide. The art of forming tools from a fine powdered mixture of the exceedingly hard tungsten carbide and soft cobalt cementing material by pressing and sintering brought about this entirely new class of tools. With them cutting speeds were still further increased and it became possible to machine steels economically that were hardened before machining, and also to machine mica, hard rubber, and other materials that heretofore had been machined with difficulty. The advent of these new tools has played no small part in the recent rapid growth of mass production in this country, as well as in the great increase of the chemical and allied industries.

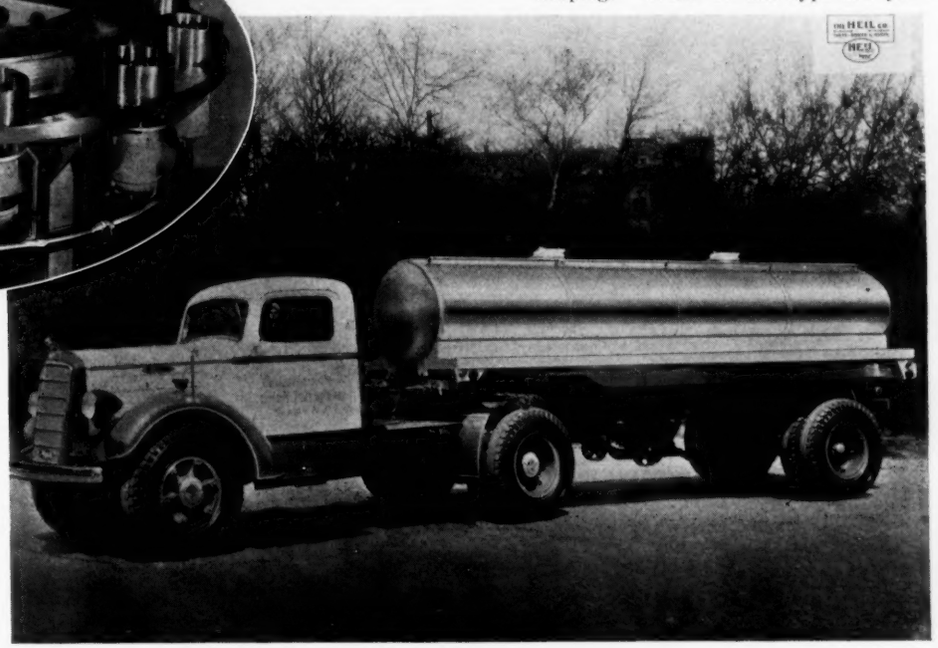
Cast Iron

While not strictly within the field of this article, mention should be made of the newer cast iron because it is so closely allied to steel and more particularly because several of the new irons are suitable for use in corrosive media and hence of special interest to the chemical engineer.

Though one of the earliest alloys of iron used by man, cast iron had been improved relatively little since early times. Recently those metallurgical principles which were studied primarily in the steel industry have been applied, so that today cast iron has become a reliable engineering material and has found wider application in the chemical manufacturing field. Formerly used largely in massive construction where stresses were almost entirely compression, cast iron is now used in relatively thin sections and is fully capable of taking tensile and complex stresses in engineering structures. Many articles that formerly were produced from steel, such as the crank and cam shafts in automobiles, are now produced from cast iron.

Alloying metals, such as molybdenum, chromium, copper, silicon, nickel and others, have been added to iron to give new properties including the ability to withstand heat and chemical corrosion. Thus, for example, the addition of small percentages of nickel and chromium stabilize and refine the structure of cast iron so as to increase its toughness, strength, wear resistance and ability to hold liquids under high pressure without "weeping." Irons of this type are par-





Top—This car with an 8,000 gallon stainless tank is used for transporting high purity chemicals.

Oval—From splash guards to motor shafts, this stainless steel lemon juice extractor is immune to the corrosive action of food acids.

Right—This 2,000 gallon, two-compartment stainless steel tank is used in the delivery of china wood oil and cotton seed oil.

ADVERTISING PAGES REMOVED

ticularly valuable in kneading, grinding, conveying and mixing equipment so widely used in the manufacture of chemicals. Still larger amounts of nickel, from 5 to 13%, with corresponding increase in chromium content, bring about true corrosion resistance so that this cheap material can be used in many pieces of chemical equipment.

Small amounts of chromium affect iron so that it no longer grows on repeated heating and cooling. As a result, many furnace parts, stoker links and grates, which must withstand frequent heating and cooling, are constructed from chromium-bearing irons. The added resistance to oxidation and abrasion which this type of iron possesses is also of value for such uses.

Little need be said concerning the high silicon irons, since they are so favorably known and widely used in the chemical industry. The addition of about 15% of silicon creates an iron of the "Duriron" type with unique resistance to sulfuric acid. It came into prominence early in the period of this article and has ably served the chemical engineer in handling and conveying sulfuric acid, the most common and widely used of all acids.

And so while the chemical industry has during the past twenty years won wide acclaim for the rapid growth both in number and quantity of its products, the steel industry also should receive due honor for the advances that it has made. By its increased ability to manufacture cheaply an improved quality of its older products and to bring out new products better adapted to specialized uses, it has shown itself able to keep pace with the rapid tempo of modern developments. Thus the important improvements in the steel industry during the past twenty years are a promise of even greater advance in the years to come.

Foreign Literature DIGEST

By

T. E. R. Singer

N. RIEHL in the *Chemiker Zeitung*, 64, 8-11 (1940) gives a review of works on the phenomenon of luminescence together with a number of photographs of applications of luminous substances to electric switchboard instruments, in decorative treatment of rooms, in advertising display equipment, etc.

Richard Aldinger, *Chemiker Zeitung*, 64, 19-20, 27 (1940) has an interesting history of former and present enamel raw materials, together with tables of sources of feldspar, quartz, cryolite, saltpeter, borax, etc., in 1920 and 1938, while the Research Institute of Lacquers and Paints in *Industrial Organic Chemistry* (*U. S. S. R.*) 6, No. 12, 687 (1939) reports improvements already in use industrially of a microphotographic method of determining the degree of dispersion of titanium dioxide pigments, etc., and A. V. Simanovskaya in *Industrial Organic Chemistry* (*U. S. S. R.*) 6, No. 11, 614 (1939) describes experimental work on dyes suitable for phenol-and amino-formaldehyde plastics. Numerous pigments such as chrome yellow, lac red, bordeaux, acid dyes such as sulfur yellow, acridine yellow, acid orange; basic dyes such as methylene blue, yellows, oranges, reds, violets, blues, greens and browns were all tested in great number.

In the field of fertilizers Hans Huber in the *Chemiker Zeitung* 64, 22-24 (1940) lists new fertilizers containing phosphoric acid in water soluble form, produced by subjection to a calcination process. This article is accompanied by many bibliographical footnotes.

In the *Journal of Applied Chemistry* (*U. S. S. R*) 12, No. 10, 1 (1939), an anonymous writer feels that the 22 year old Russian chemical industry is on the verge of becoming superior to that of the main capitalistic countries. They believe they hold first place in the production of synthetic rubber, while holding second place in making phosphate fertilizers and are producing large quantities of valuable nitrogen fertilizers for their farms. The problem of insufficient production of sulfuric acid for industrial uses is discussed. The quality of superphosphate must be improved and the soda industry expounded. In the *Journal of Chemical Industry* (*U. S. S. R.*), volume 16, No. 11, 7, (1939), M. E. Pozin gives a brief history of the Government Institute of Applied Chemistry which celebrated its twentieth anniversary last year. The Institute grew out of the chemical war committee of the Russian Physico-Chemical Association, and being the first chemical institute of scientific research it included numerous branches of the chemical industry.

According to A. Derevicher in *Industrial Organic Chemistry* 6, No. 11, 642 (1939), his process for the manufacture of chlorotoluidine is being adopted by the "Akriphin" plant. After the reduction process the ready chlorotoluidine is obtained from the surface of the reducer by siphoning. The sodium chloride-treated toluidine floats to the surface in pure form and can be separated off in 3 hours, whereas the former steam distillation method requires 90 hours. There is a great economy of steam, water and labor, and production is increased.

B. A. Matthias in the *Chemiker Zeitung* 64, 12-14, 24-25 (1940), reviews the use of vaporizing and distillation in chemical industry in general, and includes many bibliographical footnotes, while the *Chemisch Weekblad* 37, 66-69 (1940), reports a lecture by J. G. Hoogland before the Nederlandsch Institut voor Electrowarmte en Electrochemie on the nineteenth of January on electrochemistry in chemical industry.

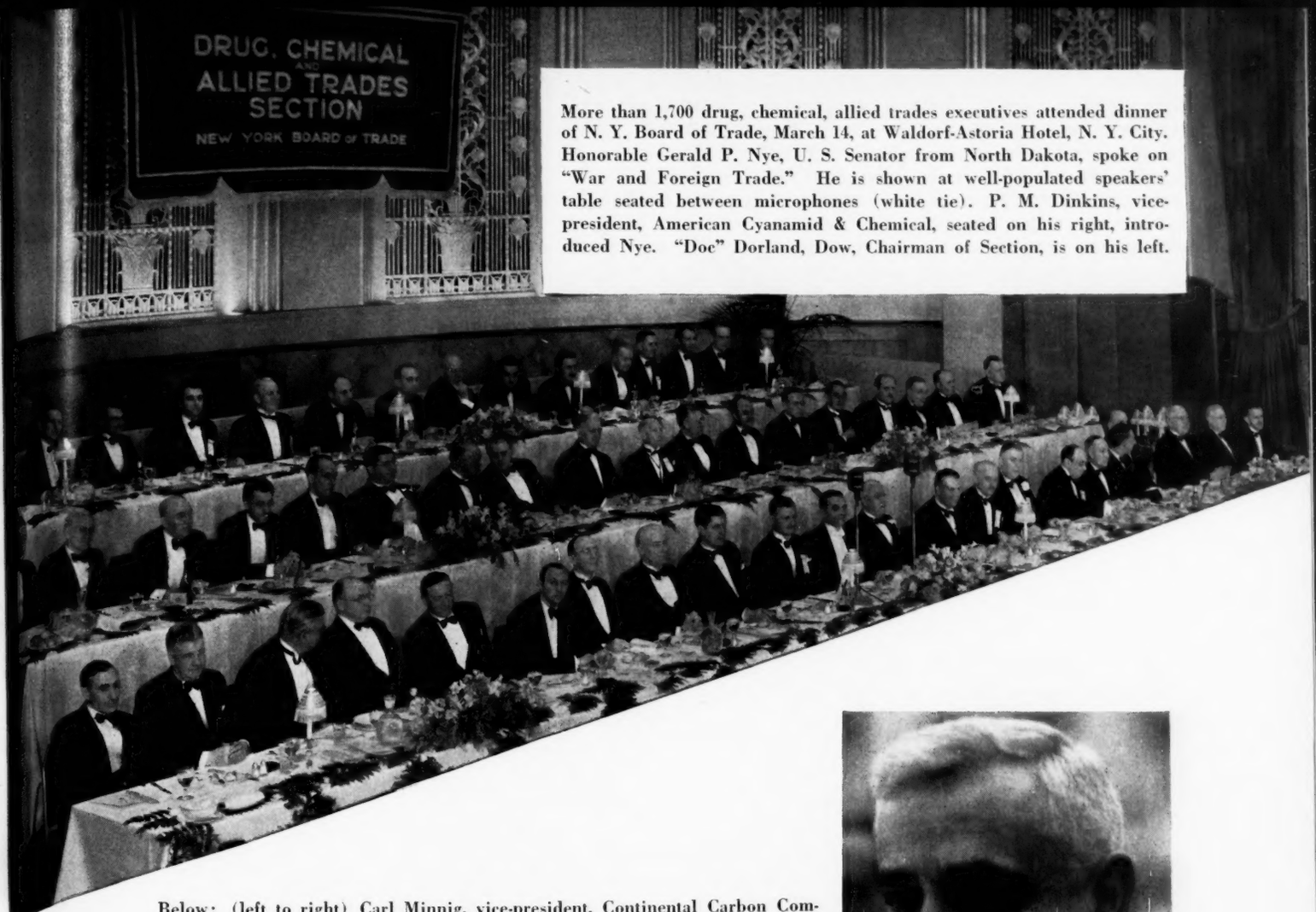
Mercury Purification

In laboratory work A. Sloof and D. van Duyn describe in the same journal 37, 67-92 (1940), a process for the quantitative determination of chlorides, rhodanides and cyanides and a qualitative reaction for the presence of chlorides in potassium rhodanide, and Alfred Dobrowsky of Vienna in the *Chemiker Zeitung* 64, 32 (1940), describes a new mercury purification process in which potassium permanganate is used.

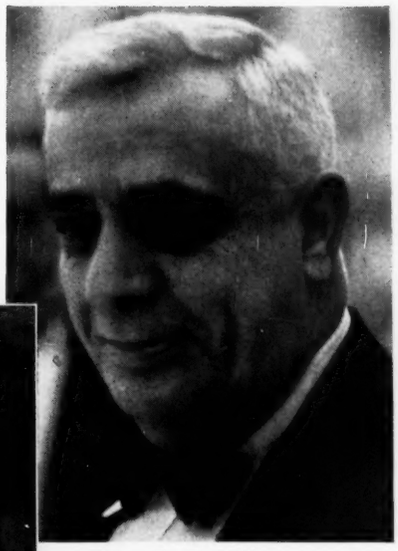
C. Berthelot, in *Chimie et Industrie* 42, 741-46 (1939), gives a very comprehensive survey of the coal mining in Europe just before the outbreak of the present war, listing the production of mines in France, Great Britain, Belgium, Holland, Germany, Poland, U. S. S. R., Italy and the Balkan countries, while H. Reif in the same journal 42, 747-8 (1939), surveys the sources of raw materials for the French chemical industry, with particular reference to rearmament requirements.

In the field of food preservation H. Cheftel has a very exhaustive article on preserving fruit juices in *Chimie et Industrie* 42, 425-446 (1939), with many references to U. S. Practice, and including an extensive bibliography.

In *Farben Zeitung* 45, 3-5 (1940), there is a survey of the year's work in paint materials in Germany, including synthetic resin varnishes. In the same journal 45, 20-21, 36 (1940), there is a description of a new Turboviscosimeter, patented, and made by Hugo Keyl in Dresden. Notes are included as to its varied uses.

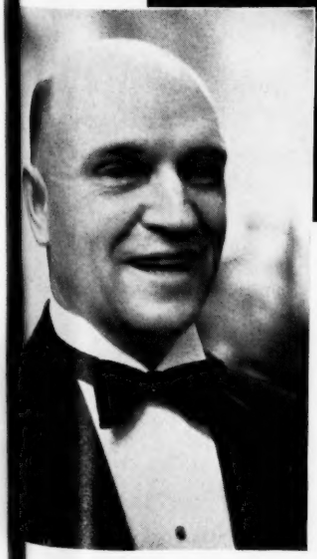


More than 1,700 drug, chemical, allied trades executives attended dinner of N. Y. Board of Trade, March 14, at Waldorf-Astoria Hotel, N. Y. City. Honorable Gerald P. Nye, U. S. Senator from North Dakota, spoke on "War and Foreign Trade." He is shown at well-populated speakers' table seated between microphones (white tie). P. M. Dinkins, vice-president, American Cyanamid & Chemical, seated on his right, introduced Nye. "Doc" Dorland, Dow, Chairman of Section, is on his left.

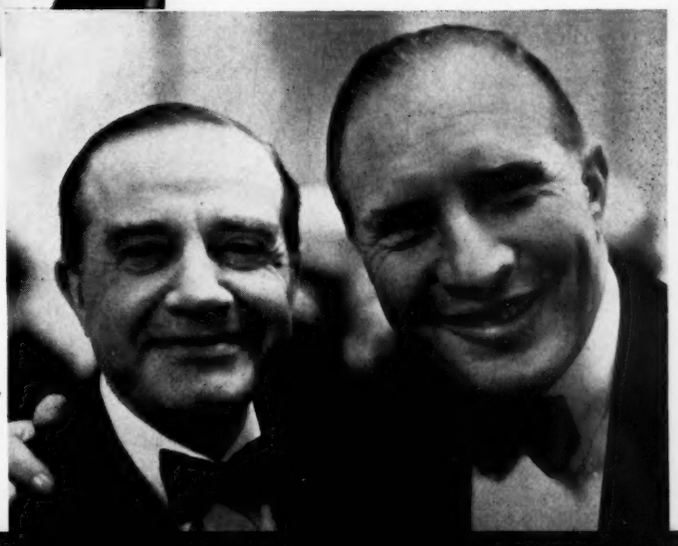


Major T. P. Walker, president, Commercial Solvents, was smiling diner at the Waldorf event.

Below: (left to right) Carl Minnig, vice-president, Continental Carbon Company; Robert I. Wishnick, president, Wishnick-Tumpeer; and Thomas J. Starkie, vice-president, Wishnick-Tumpeer, found the festivities enjoyable.



Left: George E. Riches, manager, chemical sales department, American Agricultural Chemical.



Right: Harry Farleigh, Merchants' Chemical Co. (left), and Stanley Weil, vice-president, Natural Products Refining Co.

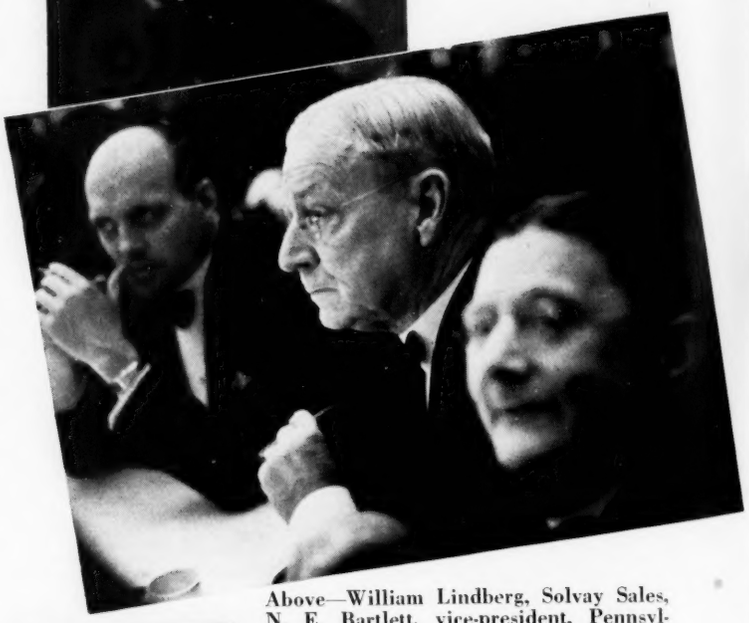
Parade

Candid snapshots of chemical figures present at

H. H. Rosenthal, president, H. H. Rosenthal Co. (left), K. Shimidzu, Nagasi Shokai representative, and Herman Bercow, H. H. Rosenthal Co., greet cameraman smilingly.

Left—H. B. Prior, president, Prior Chemical Corporation, had just spied one of his many friends when the camera caught him unawares.

Above—A. W. Heron, Canadian Industries, Ltd. (left), who trekked from Montreal to dinner, with T. A. Haschke, National Sulphur Division, Stauffer Chemical Company.

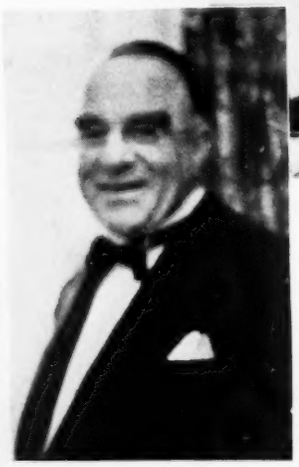


Above—William Lindberg, Solvay Sales, N. E. Bartlett, vice-president, Pennsylvania Salt Mfg. Co., and John Chew, John Chew, Inc., listening to speakers.

Right—J. Willard Jacobs, Electro-Bleaching Gas, finds something interesting on the menu.

Left — John M. Alvarez, New Haven manager of Du Pont.

Above—J. S. Cooke, assistant treasurer, William S. Gray & Company.



Left—E. Demmon, assistant vice-president, Stauffer Chemical Company.

Left—Charles Grossman, Solvay Sales (left), and Walter Lotte, president, Lotte Chemical Company

# of Personalities

annual Drug, Chemical & Allied Trades Dinner.

Above—N. Harold Pfyffe, Oldbury Electrochemical, enjoys after-dinner cigar.

Left—Edward Oren, of Du Pont's Grasselli Division, Wilmington.

Above—J. E. Devine, Standard Alcohol, turned around to find himself staring into the candid camera.

Left—Charles Waterman, H. Kohnstamm & Company, enjoyed genial conversation event provided.

Above—S. P. Kelly, secretary, William S. Gray & Co., was in the midst of taking a puff when the camera sneaked up on him.

Above—Sid Moody, Calco (left), greeting a friend who tapped him on the shoulder. (Right) The Smiling J. Rivers Adams, Warner Chemical Co.

Above—Three smiling gentlemen are I. Danchig (left), Ormont Drug & Chemical Company; G. H. Richards, treasurer, Celluloid Corp.; and A. Weiner, Standard Naphthalene.

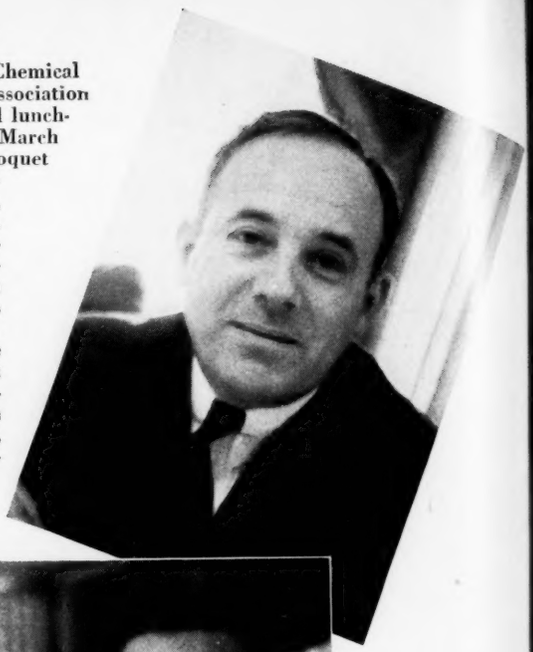
Below—John Hecker (left), Gillespie-Rogers - Pyatt Shellac, poses with F. Yamaguchi, of Mitsubishi, Shaji, Kaisha.

ADVERTISING PAGES REMOVED

Chemical Salesmen

Cal Lewis, public relations advisor for National Association of Manufacturers, American Agricultural Chemical, Industrial Chemical Sales Company, among others, was speaker at Chemical Salesmen's luncheon. His topic: "Three Men On a Horse."

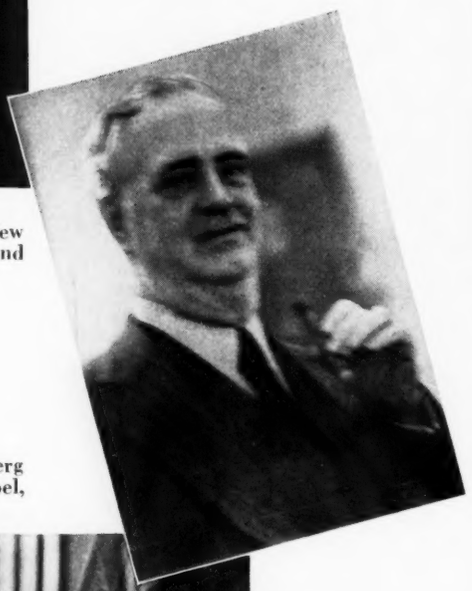
of American Chemical Salesmen's Association Industry annual luncheon was held March 14th in Perroquet Suite of Waldorf - Astoria, N. Y. City. President, DeWitt Thompson, Mathieson Alkali, is shown (left) addressing the group. On right is Walter Merrill, Joseph Turner & Co., group's vice-president.



Above: C. V. Douglas, Diamond Alkali (left), with F. W. Fraley, Jr., Director of Sales, Diamond Alkali.

Below: Frank McHugh, purchasing agent, N. Y. Quinine & Chemical, and (left) John Seidler, Whittaker, Clark & Daniels.

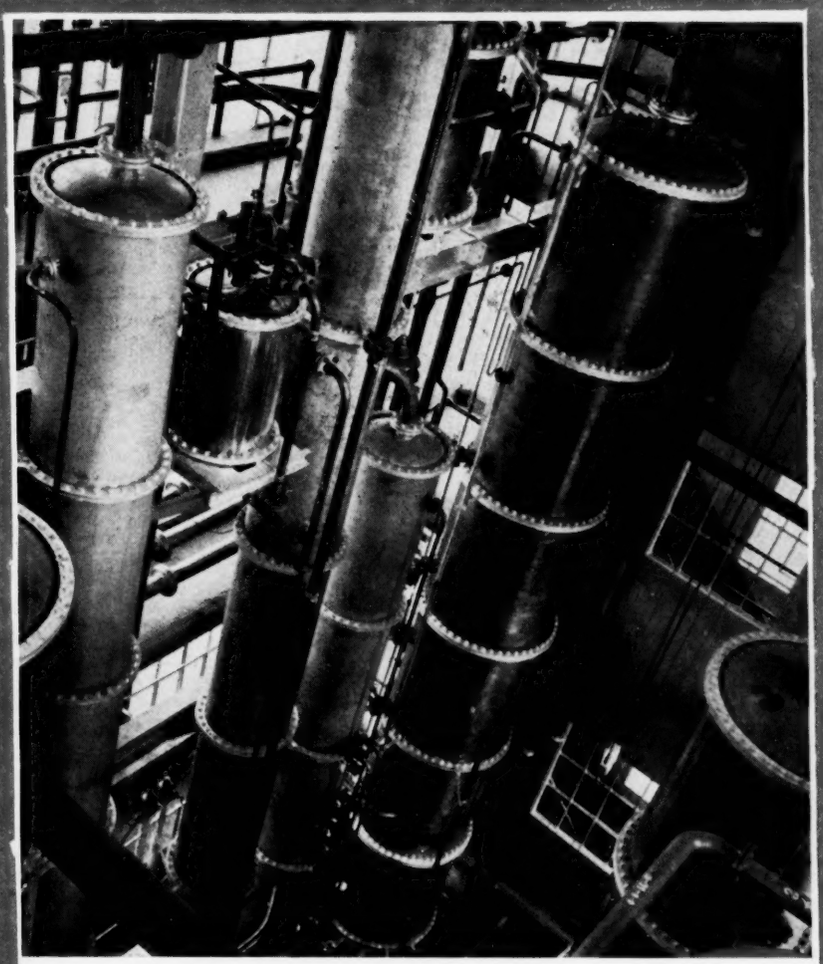
Right: Ben Spencer, New York chemical broker and distributor.



Below: William Neuberg, Neuberg Chemical Corp. (left), with Ray Giebel, Harshaw Chemical.

Right: (above) W. N. "Shorty" Wyatt, assistant sales manager, Warner Chemical. Below: R. L. Hutchins, New York sales manager, Commercial Solvents.

PLANT OPERATION AND MANAGEMENT



Alcohol Recovery Stills at Shawinigan Plant

Towering in one section of the new vinyl resin plant of Shawinigan Resins Corporation at Springfield, Massachusetts, are these alcohol recovery stills. A Monsanto subsidiary, Shawinigan manufactures new safety glass plastic, vinyl acetal at plant. Open house was held recently during which a number of industrial chemists were given "behind the scenes" view of operation.

A DIGEST OF NEW METHODS AND EQUIPMENT FOR CHEMICAL MAKERS

CHEMICAL INDUSTRIES

Replacement or Substitute

By
Edward Rosendahl
Vice-president
Glyco Products, Inc.

THE word "substitute" denotes to many people the use of a product which is not quite as good as the one it is meant to replace. Emphasis is placed on price which, in nearly all cases, is considerably lower than that of the original product. Thus, in normal times, substitutes are considered with a good deal of suspicion. Even the chemist, who, by the very nature of his profession, looks at things with a very open mind, but who, contrary to popular belief, is also human, is apt to feel that substitutes should only be considered in a time of real emergency. Confronted with his daily problems of control, development and research, he, very understandingly, leaves production formulae severely alone as long as they are working out smoothly and find customer acceptance.

It is only when difficulties are encountered in his formulae or when customer complaints begin pouring in that he begins to consider changes that necessarily have to be made. Even then, it is not a substitute that he is looking for. The thing that he is seeking is an improvement. One or more of his basic materials is not performing to his complete satisfaction. Therefore, a material must be found which will give him an improved final material. Apart from instances such as this, his interest in substitutes is very slight under normal conditions.

When, however, due to war conditions, failures of natural crops, etc., some of his raw materials have been rendered unavailable or have so increased in price as to make their continued use uneconomical, he becomes substitute-conscious, and is not apt to quibble over whether the word is "substitute" or "replacement," as long as the material does the job. It is then that his real troubles begin. He studies the advertisements in the trade papers, he reads the literature of various companies and he gets small amounts of possibly suitable materials to try. If he is not very careful, he is liable to swing right over to the other side, and just as he previously thought that no substitute could ever replace his raw material, so now he may imagine that all he has to do is to replace the original material by the substitute in the formula and everything will be fine. His disappointment is thus all the greater when he finds out (unless he's very lucky) that things don't work out in that fashion.

It must be remembered that no substitute will have all the properties possessed by the original material. If such were the case, it would no longer be a substitute—it would *be* the original material. Furthermore, it must be remembered that in most cases, only a few of the properties of a particular raw material are utilized in any one formula so that an exact duplication of all properties is very seldom required. This can very clearly be seen if we consider a particular case. Glycerine is used very extensively in many varied industries, but only a few of its many properties are of interest for each use. Thus, the cosmetic manufacturer uses glycerine for its softening and emollient properties. He is also interested, in certain cases, in its thickening action. Naturally, he desires a product which is as light in color and free from odor as possible. The automotive industry, using glycerine for antifreeze purposes, obviously has no need for its softening, emollient or thickening properties. Its requirement is for a water soluble, low freezing point liquid which, of course, must be non-corrosive. The food industry is interested in glycerine because of its sweetness and bodying properties, the resin manufacturer, on account of its chemical nature and reactions, and so on. It is, therefore, evident that in considering a substitute, only those particular properties which are actually required should be looked for. Sometimes these properties are not as clearly or sharply defined as the illustrations cited above. In that case, one can only fall back on the "trial by error" method. Experimental work is obligatory in such a case.

Another point to be borne in mind in connection with substitutes is the method of using them. A formula is developed, improvements and changes have been made over a course of years. The best methods of handling raw materials have been worked out. Reaction times and temperatures have all been studied very carefully. That another material can be substituted directly without having to make any changes in formula or methods of procedure is something that can only be devoutly hoped for, but not by any means expected. In the absence of any recommendations from the manufacturer, one is perforce obliged to substitute it directly in the formula in an experimental way. If it should not give the desired results (as would probably be the case), then further experimental work must necessarily have to be conducted. The material must be treated as an absolutely new product and handled as such. The amount of such work that can or should be done will depend entirely on the urgency of the need or the time at one's disposal. Unfortunately, most people put off investigation of substitutes until the supplies of the original materials have been curtailed so drastically that it is a matter of necessity to get a replacing product. If consideration were given to such substitutes before the demand became so pressing, it would be more than worth while, if only from the point of view of having an alternative formula if the original one is no longer available.

There is always the added incentive in experimenting with substitutes that the differences in properties may give improved characteristics to the finished product. When the use of Chinawood oil (tung oil) was suggested many years ago in place of linseed oil for the paint and allied industries, there was considerable opposition on the part of the paint manufacturers. Their contention was that in replacing weight for weight and in exactly the same manner, the results obtained were inferior to those obtained from using linseed oil. A shortage of linseed oil and the consequent rise in price obliged the paint manufacturers to investigate the Chinawood oil idea a little more closely. It was tackled with an "I've got to make you work" attitude rather than with the "I dare you to work" attitude that had prevailed before. Much to the astonishment of the paint manufacturers themselves, Chinawood oil succeeded not only in replacing linseed oil, but in imparting properties to the finished material which linseed oil was never able to give. So much so, that when Chinawood oil became scarce and high in price some few years afterwards, linseed oil was looked on, in its turn, as merely a substitute and a very poor substitute at

that. Incidentally, both attitudes were wrong because Chinawood oil and linseed oil have their very definite place in the paint, varnish and allied industries.

A few years ago when glycerine prices rose tremendously, there was a widespread demand for glycerine substitutes Because of the many and varied uses of glycerine, the manufacturers of substitutes realized that it was impossible to supply one product which would meet these various uses. Thus, glycerine substitutes were offered according to properties and suggested uses. It was necessary for the purchaser to study these properties to see which more nearly fitted his requirements. An interesting commentary on this is the fact that many users of glycerine were somewhat at a loss to define the actual properties they required. In certain cases, they demanded a product as hygroscopic as glycerine, whereas on further inquiry, hygroscopicity was one of the properties that was always causing them trouble. What they really required was a non-drying material and when a certain product was offered them which was non-drying, but was also non-hygroscopic, the results they obtained were so markedly superior to their previous results that even when the price of glycerine returned to normal, they continued to purchase the so-called substitute material, even at a higher price.

Physical Properties

These examples illustrate that, in certain cases, properties possessed by substitutes may give definite improvements over the materials originally used. It, therefore, is advisable for the manufacturer who is seeking a substitute to be as frank as possible with the supplier. If the problem is presented to the supplier in a complete way, he can be of considerable assistance in helping to arrive at a satisfactory solution.

In this article, reference has been made to substitutes solely from the point of view of physical properties. Where a product is used chemically, that is, where the finished materials are chemical compounds produced by the chemical reaction of two or more products, the problem is entirely different. Taking the case of glycerine again, the use of this material in the manufacture of ester gum, nitroglycerine and certain types of synthetic resins, is due to the chemical change taking place when glycerine and certain other materials are reacted together. The question of substitutes in this case is one which can only be solved by extensive chemical research.

The primary factor which brings the question of substitutes to the fore is unavailability or shortage of particular raw materials. This immediately leads to increases in price which, in aggravated cases, make the continued use of such raw materials impractical from a cost angle. Importing, as we do, well over $100,000,000's worth of chemicals and allied products annually (the figures for 1938 were $121,000,000 according to information published by the Chemical Division of the U. S. Bureau of Foreign and Domestic Commerce), any interruption of such supplies is liable to lead to serious difficulties in our domestic markets. Thus, in the case of war, shortage of labor for non-armament purposes in belligerent and many neutral countries, curtailment of shipping services, sinking of vessels, all contribute their part in rendering the importation of raw materials more and more difficult. It is, of course, possible to produce these materials in the United States, but whether such a course is both practical and economical, is another question. In many cases, the materials imported require special climatic conditions which, perhaps, could be induced artificially in this country. However, the cost of so doing would materially affect the price of the commodity to be produced.

Work Costly, Lengthy

Furthermore, development work of this nature is costly and lengthy. In some cases, it takes years before a crop can be brought to maturity. Low labor costs in other countries and abundance of raw materials in normal times are also factors to be taken into consideration. Furthermore, in numerous cases, the amounts of individual items used annually are too small to make their production in the United States a profitable proposition. It is true that synthetic products have been produced, in certain cases, which not only replace the natural materials, but which give results unobtainable with such natural materials. One has only to consider the numerous synthetic resins produced commercially in the United States in this particular connection. Enamels, varnishes and lacquers of all types give results today due to the incorporation of synthetic resins which formerly were beyond the realms of possibility.

In closing, it might be well to consider the various types of materials of a chemical and allied nature for which the United States relies on outside sources and which help to account for the $121,000,000 previously quoted. Many of the vegetable oils used in the United States are imported either in the form of the oils themselves, or in the form of seeds or beans for pressing into the oils. Vegetable and certain mineral waxes used in polishes, cosmetics, dental work, record and phonographic work are also imported. Some of these waxes which are imported from Germany and Central European countries are completely unobtainable so that substitutes are a necessity for continued work. However, tremendous strides have been made in this country in synthetic waxes, so that it is only a matter of time before domestic synthetic waxes will replace imported natural waxes just as domestic synthetic resins have taken the place of many of the imported natural resins. In the field of water soluble vegetable gums, progress has been somewhat slower, although even here, synthetic products have been meeting with marked success, particularly where such gums have been used for edible and pharmaceutical emulsions and thickeners. Over a million dollars' worth of shellac was imported from India in 1938. However, substitute shellacs are also well known. Unfortunately, some of the raw materials for substitute shellac are also imported, so the manufacturer is now in the position of looking for a substitute for substitute shellac.

It is, therefore, evident that while our present dependence on imported raw materials is quite great, it is lessening continually. Added impetus is, of course, given to research and development in these fields by wars and similar world catastrophes which materially affect the continuity of supplies of many raw materials.

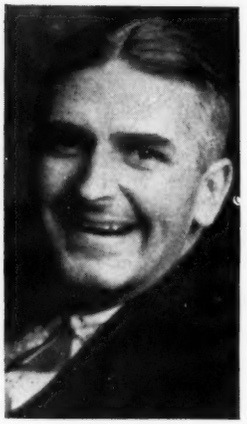
In summarizing, therefore, we see that many substitutes are available for existing products, but that such substitutes must, in most cases, be considered as entirely new products and handled as such. If the manufacturer will look on these products as additional materials which will help him overcome certain difficulties, he will be in a much better position to help himself when his supplier tells him that his raw material is no longer available.

Stabelite for Adhesives

"Stabelite" resin is a brand of hydrogenated resin. It is an acid resin consisting of partially and completely hydrogenated acid and non-acid constituents of rosin. It is pale colored and retains the pale color when exposed to air and light. Ordinary rosin, when compounded with rubber for adhesives, has the disadvantage of promoting oxidation. Because "Stabelite" is quite resistant to oxidation, an improved rubber base adhesive composition may be formulated by substantially the same process which is now used in making ordinary rubber base adhesives. Such an adhesive material is quite resistant to deterioration on ageing. In some cases, it may be necessary to make minor adjustments in formulation due to the slightly lower melting point of "Stabelite" rosin as compared to the ordinary rosin. Where the light color is a factor in adhesives, the initial pale color of "Stabelite" coupled with excellent color retention makes its use attractive. Another feature of "Stabelite" is the extremely low metals content. Spectrographic analyses detect only minute traces of copper (2-3 parts per million) while no manganese shows up in such tests. It is known that the presence of copper and manganese tend to cause rapid deterioration of rubber compositions.

Shipping and Container FORUM

By R. W. Lahey



Bulged Head Drum Solves Problem of Packing Liquids Which Solidify in Container—Valve Pack Filling Discussed

PRODUCTS which are packed in liquid form and solidify after cooling, have long presented a problem which has been difficult to solve. The cooling liquid contracts and after it solidifies there is a void in the top of the drum, often extending down several inches. The container is supported by the solid pig except at the filling head where the shrinkage occurs. Transportation abuses dent the drum at that point

and when it arrives at its destination, it is often badly battered. This support, provided by the solid contents allows the use of drums fabricated from such light steel as 28 or 30 gauge. Some shippers attempt to overcome the battered appearance by using heavier metal in the drums, but with indifferent success. Another important consideration is the reduction in container cost, which can be accomplished if the void, which often amounts to 10% of the volume, could be filled with the product.

The General Naval Stores Company struggled with this problem for many years and finally invented and patented the cone or bulged head drum which solves the problem. They have licensed several drum manufacturers to fabricate these drums so that users will have no difficulty in obtaining them.

The theory, of course, is that a sufficient quantity of the liquid can be accommodated in the dome of the drum to fill the shrinkage void. After the product solidifies and the drum is closed by reaming in the friction lid, it is upended and the bulge is collapsed. The bulged head is constructed with three or four circumferential beads, which when the head is collapsed, dispose of the excess metal.

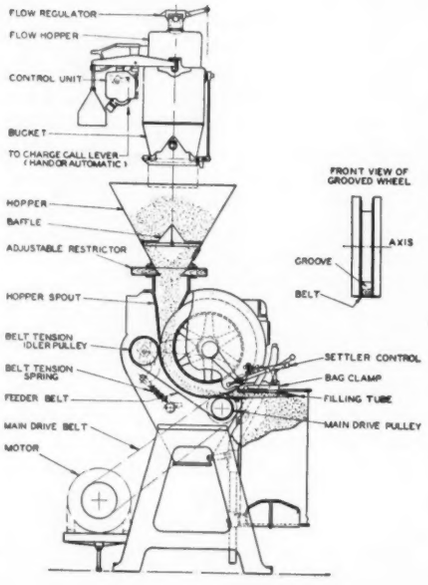
The use of this drum will eliminate complaints about the battered appearance of the drum and reduce container costs by as much as 10% in some instances.

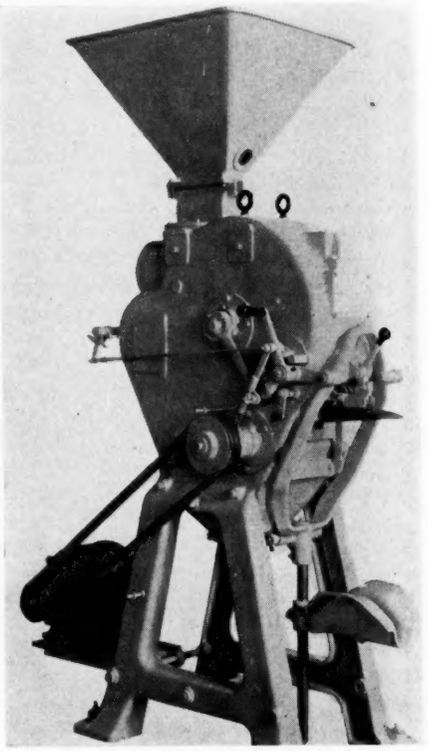
Simple Equipment For Filling Valve Bags

The St. Regis 300 P B packer is designed for filling valve bags where high production rates are not required. It is ordinarily designed to pack 100-pound bags but can be equipped for 50-pound or 25-pound bags as well. It successfully handles such products as sugar, salt, calcium chloride, ammonium sulfate, etc.

Some type of automatic weighing equipment must be provided to drop into the packing hopper pre-weighed charges, as the function of this machine is merely to transfer the material into the valve bags. The illustration shows that the product flows into a grooved wheel, contacted by an endless belt around its periphery. The belt moves at a speed of approximately 2000 feet per minute and literally throws the material through the filling tube into the bag.

This packer is equipped with a settling device. The bag chair which supports the bottom of the bag when it is placed on the filling tube is vibrated by a connection with the shaft on which the grooved wheel is mounted.





The use of this equipment eliminates the necessity for closing filled open mouthed bags by sewing, sewing and taping, or wire tying.

Packaging Exposition

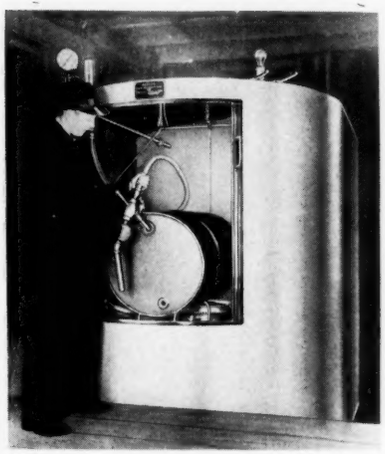
Tenth Annual Packaging Exposition held March 26-29 at N. Y. City's Hotel Astor drew more attendees than any previous show in the series. Alvin E. Dodd, president, American Management Association, its sponsor reported. A battery of typists were continuously busy furnishing badges to visitors without which they could not be admitted to exposition floors.

Trend toward packaging products at present sold in bulk was seen by George A. Mohlman, vice-president, Package Machinery Co., Springfield, Mass. Said Mr. Mohlman:

"Thousands of items still wait to be packaged for the first time. . . . These improvements will mean greater sales and lower unit costs, placing products within the means of many thousands more consumers."

Oil Drum Reconditioner QC 66

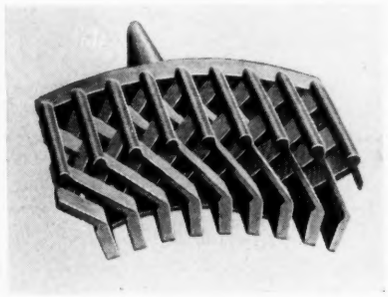
A new machine which greatly reduces the expense of cleaning and drying used oil drums has recently been developed. The machine automatically cleans and drys both the inside and outside in one continuous operation. This reconditioner consists primarily of motor-driven turntable and pumps, spray and siphon units and tanks, all enclosed in a metal cabinet. In operation, the drums are placed on the turntable, a combination pressure and siphon nozzle inserted in the opening in the drum, and the cabinet door closed.



Closing the door starts an automatically controlled cycle during which the machine successively forces into and over the drum, a caustic solution, rinse water, and air for drying, simultaneously siphoning all liquid from the drums. On completion of the cycle, the control de-energizes. The electric circuit is reset automatically when the cabinet door is opened.

Valv-Amp Rotor QC 67

A new type rotor construction, offering the advantage of longer motor life with less maintenance, has been announced. This improvement makes possible the use of cast-aluminum rotors in the larger sizes of double squirrel-cage motors for high-starting-torque, low-starting-current service. Called the "Valv-Amp" rotor, it



makes use of a unique shape of rotor slot and a special method of assembling rotor punchings to control the flow of starting current. As a result, without the use of a switch or other moving parts, current is permitted to flow in the outer squirrel-cage when the motor is started, thus producing high-starting torque. Then, when the motor comes up to speed, current is allowed to flow through the entire rotor "winding," resulting in excellent running characteristics. Of the two conventional methods of double-squirrel-cage-rotor construction, i.e., casting the conductor bars and short circuiting rings integral or joining them by brazing, the former method is by far the more satisfactory because it is a simpler operation, with smaller chance for human error, and results in a more compact, uniform product. However, until the Valv-Amp development, it has not been practicable to cast double-squirrel-cage rotors in the larger sizes. The Valv-Amp development, however, allows the construction of larger cast-rotor motors which inherently combine the advantages of the double-squirrel-cage motor, such as high-starting torque, low-starting current, and excellent running characteristics, with advantages of the conventional cast-rotor motor—simplicity of construction, long motor life, little maintenance, and permanence of electrical characteristics.

NEW EQUIPMENT

Electric Solderer QC 68

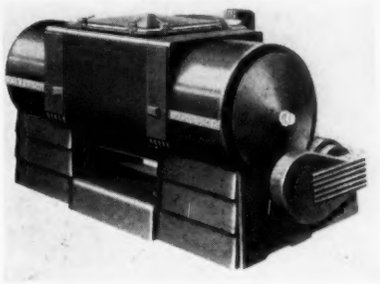
A new electric solderer especially recommended for all kinds of light soldering has been put on the market. Called the "Instant Heat" because it heats instantly upon touching the wire or terminal to be soldered, this tool is ideal for all kinds of light soldering found in service work. Being hardly larger than a lead pencil it easily reaches and solders in hard-to-get-at places. Heating stops instantly upon taking the carbons away from the wire or terminal so that as the soldering is finished the tool can be laid down without fear of scorching or can be put away in the kit. It is safe to use. The line current is reduced by a transformer to harmless low voltage so that there is no danger from electrical shock or burns.

Laboratory Mixer QC 69

Laboratory workers will welcome the latest improvement in the new "Power-Mix." This unit is now supplied with a monel support arm which fits into any clamp and allows the mixer to be adjusted at any angle whatsoever. The extra power of the new "Power-Mix" enables it to run continuously on heavy fluids such as glues, lacquers, paints, asphalts, syrups, food products, latex, pharmaceuticals, etc. Speed may be varied from 0 to 1350 R.P.M. It will run 24 hours continuously without damage, needs no lubrication, and is explosion-proof when used with hazardous liquids. The chuck is adjustable so as to take glass or metal stirring shafts.

Mixing and Kneading Machinery QC 70

A new line of "Kneadmaster" mixing, kneading and processing machinery has been introduced. The "Kneadermaster" mixer is said to represent entirely new design principles throughout, with no resemblance whatsoever to any former or competitive construction. The "Kneadermaster" performs many difficult process



operations with ease and economy, and is particularly useful for mixing and treating heavy plastics and tenacious materials. These mixers are offered in almost any desired batch capacity up to 1500 gallons, in 60 different combinations of frames, sizes and horsepowers. Experimental units are available from 1-3 gallon size in a large variety of types.

Motor Truck Scales QC 71

Three complete lines of motor truck scales, comprising 128 different styles with weighing capacities up to 70,000 pounds, have recently been announced by a large manufacturer of weighing equipment. Models will cover a full range of lever sizes, for platforms up to 40 feet by 10 feet. The company will also offer a complete selection of weight-indicating methods,—automatic dial, beam, type-registering beam, beam indicator, and printweigh ticket printer. Each installation will be handled completely, from factory to user, without the customary necessity of dealing through local or independent distributors.

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

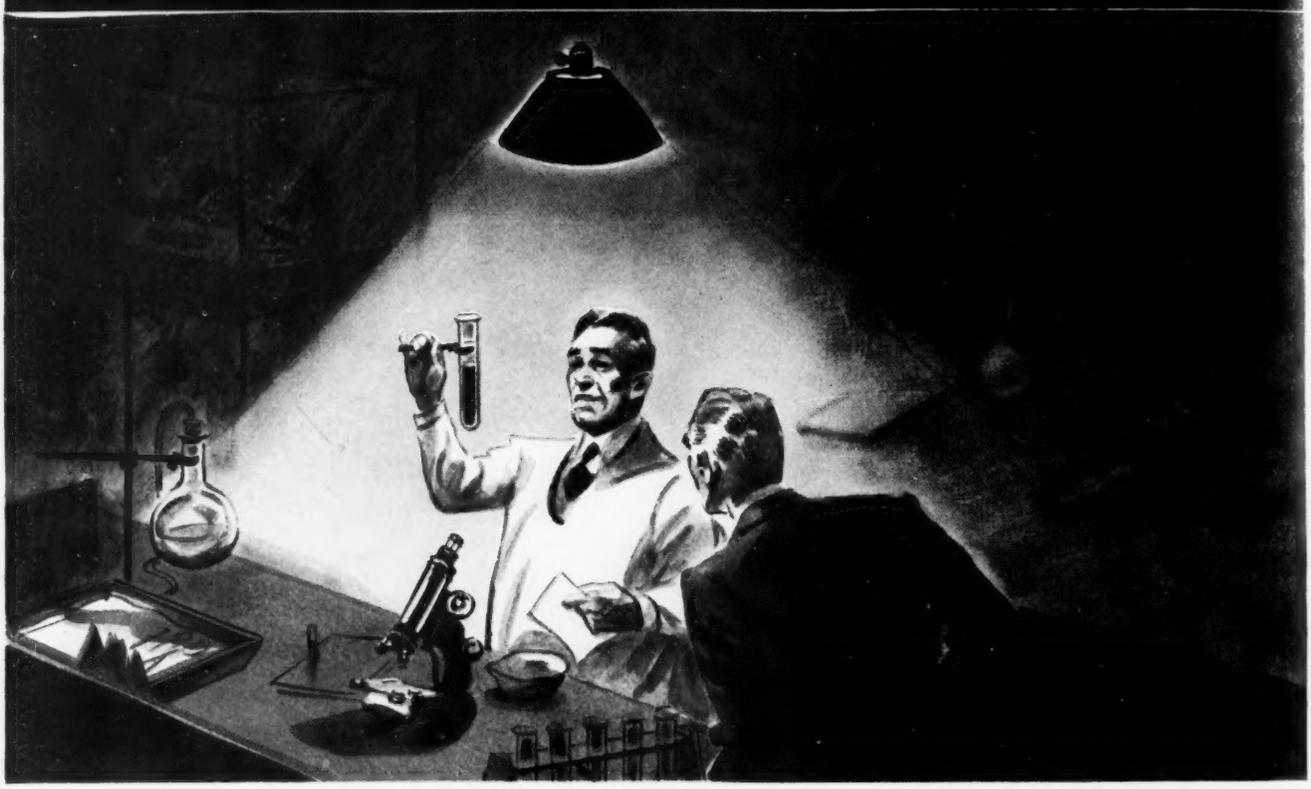
QC 66	QC 69
" 67	" 70
" 68	" 71

Name .....

Title ..... **Company** .....

Address .....

CAN IT SOLVE A PROBLEM FOR YOU, TOO?



THE PROBLEM OF MAKING NEW AND IMPROVED PRODUCTS IN THE CELLULOSE ESTER FIELD HAS BEEN SOLVED BY PROPIONIC ACID. DOES IT OFFER A SOLUTION OF YOUR PROBLEM?

● Acetic acid has long been commercially available, and from it have come many important applications. Yet because the higher fatty acids have not been commercially available, the process industries have until now been limited solely to the use of this one acid.

The cellulose acetate industry offers one illustration of what can be accomplished now that **propionic** acid is also available. Cellulose **propionate** and the mixed ester, cellulose aceto-**propionate**, possess greatly improved properties for many applications.

With **propionic** acid available by the tank car, a new field of research is opened up to all industries. It will doubtless be found that this acid is as advantageous for numerous other processes as for the manufacture of the cellulose esters themselves.

For convenience in considering its unique properties for *your* processes, we present this comparison:

Comparison—PROPIONIC ACID and Acetic Acid

PROPERTIES	PROPIONIC ACID		ACETIC ACID
Molecular Weight	74.05		60.03
Boiling Point, 1 atm.	141.4°C.	286.5°F.	118.2°C.
Freezing Point	—20.8°C.	—5.4°F.	16.6°C.
Specific Gravity, 20°/4°C.	0.992		1.0493; 1.0380
Weight per U. S. Gallon, 68°F.	8.28 lbs.		8.77
Refractive Index, 20°C.	1.3868		1.3736
Heat of Vaporization	55.8 cal./g.		96.8

NOTE: PROPIONIC ACID is completely miscible with water, ether, alcohols and most organic solvents.

HIGH-PRESSURE CHEMICALS SYNTHETIC

DU PONT

E. I. DU PONT DE NEMOURS & CO. (INC.) DU PONT

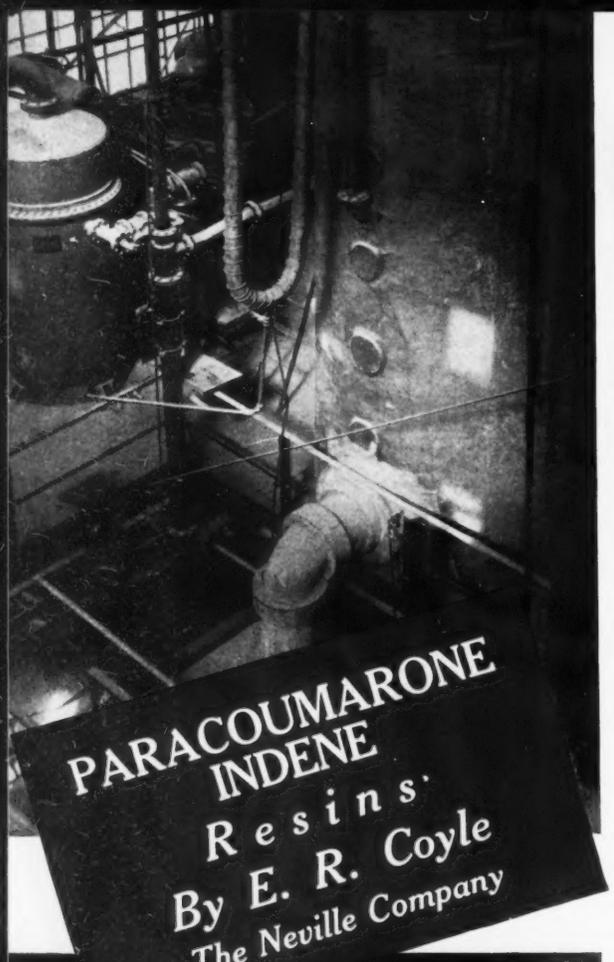
AMMONIA DEPARTMENT WILMINGTON, DELAWARE

NEW CHEMICALS FOR INDUSTRY

Dr. Ernest Hauser, M.I.T., shown experimenting with new substance, developed by him, which he calls "Alsifilm." Material is impervious to strongest acids, alkalies, fire, oil, and water. Dr. Hauser is transforming crude bentonite clay into the substance which can be made as pliable as silk. Development may eventually produce new cloth, it is believed. Crude bentonite is mined in Wyoming, Dakota, California, and other places.

Digest of Chemical Developments in Converting and Processing Fields

CHEMICAL INDUSTRIES



PARACOUMARONE INDENE Resins

By E. R. Coyle

The Neville Company

Top—Resin still and fractionating column in Neville plant. Center—Agitators in the resin plant. Below—A battery of raw material storage tanks.

PARACOUMARONE-indene resins are generally known as coumarone resins. Commercially speaking, the preparation of coumarone resins may be regarded as an achievement in effective utilization of what were, not so many years ago, regarded as waste products. The non-progressive coal by-products producer attaches a certain stigma to the name "coumarone resins" because he associates them with sludges, still residues and other waste products. Yet it has not been so many years since all of the now well-known and recognized indispensable coal-tar products were also regarded as waste products.

We could trace historically the chemical development of coumarone resins, but this would be without profit since the information is generally available in standard reference works. Let us just outline briefly the answers to the following questions:

1. What are coumarone resins?
2. How are coumarone resins made?
3. What are coumarone resins used for?

Concerning origin, they are made from crude solvent naphtha Number 2, which is a minor constituent of coke oven light oil boiling approximately between 135 and 200° C., or selected fractions between these limits. On analyzing a typical crude solvent Number 2, you would obtain the following distribution of constituents:

About 60%	unsaturated resin forming compounds
36%	aromatics
4%	unsulfonatable hydrocarbons

Coumarone resins are polymerized from the 60 per cent. unsaturated constituents by various means which we will discuss a little later. Neville Resins, trade-name of the Neville Company for its coumarone resins, are true synthetic resins. They are produced to specification under carefully standardized conditions, not merely recovered from coke oven or gas works waste. Under these conditions, the manufacturer has accurate control over the actual physical properties of his product. Physically, R-11 Neville Resin is typical of coumarone resins. R-11 Resin softens at about 100° C. and melts at about 130° C. by the cube-in-mercury method, and when melted down, it does so quietly without any foaming or decomposition, and with mild odor. The molten resin has a characteristic low viscosity and if heating is continued beyond the melting point, active destructive decomposition does not occur until about 360° C. The resin is truly thermoplastic so that you can repeatedly melt and solidify it without substantial change in its useful physical properties. The most useful of these physical properties are its chemical inertness, non-saponifiability, its hydrocarbon nature, and its ready solubility in numerous commercially used solvents.

E. R. Coyle

In a strict sense, resins of the higher grade coumarone type are produced from the 170-190° C. fraction of crude solvent naphtha Number 2. Within this boiling range the two constituents that yield resins are coumarone and indene. For resin production purposes, these behave very similarly, so much so that the physical properties of the resulting resins are chiefly a function of their molecular weight. Experience has shown that the polymerization is not progressive or additive, but that the mean molecular weight of the product and the distribution of molecular sizes are chiefly dependent on mass action and other physical conditions occurring during the reaction.

The effect of the distribution of molecular weight on physical properties of the resin is most important, as this feature controls compatibility and solubility of the resulting resin. When the mean molecular weight of the resin exceeds about 700, the resin ceases to be compatible with drying oils, such as chinawood oil or linseed oil. Furthermore, when the mean molecular weight of the coumarone resin exceeds about 600, it ceases to be soluble in petroleum solvents; therefore, it is apparent that the natural lines of development in coumarone resins are directed toward control of molecular weight and distribution of molecular size.

To clarify the importance of this point, let us consider a little further. The molecular weight of the coumarone-indene monomer is about 116, melting point —30° C. The molecular weight of the dimer is about 232, melting point —5° C.; of the tetramer, the molecular weight is about 464, melting point about 80° C.; the octamer, the molecular weight is 928, melting point 200° C. A great many users think that coumarone resin is made by boiling solvent naphtha with sulfuric acid. Suppose just this were done. Aside from a large proportion of sulfonated products, you would get a resin melting about 114° C., containing polymers ranging in

size from 232 to about 1700. This resin would not be compatible with drying oils and would not be soluble in mineral spirits. Moreover, the resin produced by a series of such treatments in daily production would be highly variable in plastic properties, although it might be quite uniform in melting point.

In striking contrast to this haphazard method of approach, reaction conditions are so controlled that when a resin is wanted of higher melting point, about 150° C. or slightly higher, but compatible with drying oils, a composite is produced that is about 50-50 tetramer and octamer, melting at about 150° C. and substantially free of dimer (oil) and higher polymers. Similarly, when a resin is required with a fair degree of compatibility with paraffin wax or good solubility in petroleum naphthas or oils, it is made to melt at about 125° C. and to be largely tetramer and free from higher polymers and from oils. It is by means of these controls that a high degree of uniformity of physical properties of Neville Resins is achieved.

Although commercial classifications require only control of color, melting point and ash content, the day is passed when these properties alone will serve the multitudinous uses of coumarone resins. Each use, to guarantee complete satisfaction to the customer, requires examination of special requirements.

Coumarone Facts

Among customers, some confusion exists on how resins of various melting points are made. There seems to be a mistaken assumption that all coumarone resins are hard resins cut back with dimer oils. Following are the facts: melting points from 110 to 150° C. are achieved by control of molecular structure during polymerization; melting points below 110° C. are made up as hard resins cut back with dimer oils. Progress has been made in this latter class of resins cut back with dimer oils in that the oils used for cutting back are especially refined and freed from all traces of monomer and other impurities boiling below 300° C.

These dimer oils are very interesting products. They are approximately equal mixtures of dicoumarone and diindene and are sold under the trade-names Nevinol and No. 2 Refined Heavy Oil. They are moderately viscous, chemically inert, high boiling oils, boiling range 300 to 360° C. They have mild odor, high solvent power and low volatility and find wide use in such varied applications as chlorinated rubber coatings, adhesives, fly ribbons, aluminum paste, etc., in addition to being used as cut backs for coumarone-indene resins. Nevinol is the more refined grade of these dimer oils, being generally paler in color and having a milder odor. There is also made a modified type of this oil, which is a phenol-coumarone-indene reaction complex and goes under the trade name P.H.O. Features of P.H.O. are its high viscosity, unusual compatibility with such materials as vinyl acetate polymers with which the ordinary oils from coumarone-indene resins are not compatible, and its widespread use as an anti-skinning material in surface coatings and inks.

To return to resin production methods, it is easy to see that control of the molecular structure on the part of the manufacturer is a real asset to the user of coumarone resin in insuring adaptability and uniformity. Temperatures, concentration of reactives, selection of catalyst, and means for contacting, all play a part in securing these ends. Modifications may be introduced, such as polymerization under heat and pressure, condensation with tar acids, hydrogenation, and working and refining by-products; all contribute a share to extending the range of applications and needs served by coumarone resins.

Neville Resin is available in a wide range of melting points, from a soft, very viscous liquid about 10° C. melting point, up to a hard, brittle solid melting at about 150° C. Depending upon the importance of color in one's work, a wide range of colors can be obtained, the lighter colors being comparable to WW rosin, or paler, and the darker ones ranging almost to black or very dark brown, if desired.

Concerning solubility, coumarone resins are quite soluble in solvents of ordinary commercial use with the exception of the alcohols. Coal-tar and petroleum solvents and the new aromatic petroleums are widely used, also turpentine and, of course, the resins are compatible with all of the commonly used drying oils and most other synthetic resins.

Neville solvents starting their trip to market from siding at Neville plant. Note line of tank cars at left.

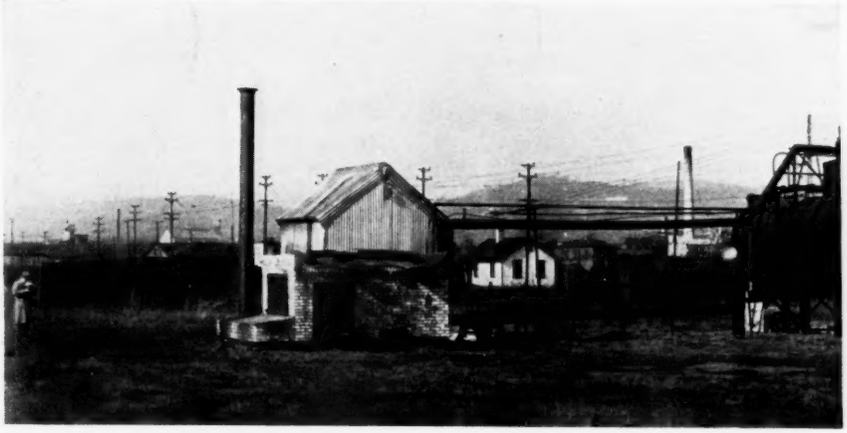
It might be well to mention here that while ordinary coumarone resins are not soluble in butyl, ethyl and methyl alcohols, etc., there is one grade of Neville Resin, known as Nevillac, which is a phenol modified coumarone resin, which is soluble in alcohols, and compatible with vinyl acetate polymers, and in certain proportions with nitrocellulose and cellulose acetate, which are other properties distinguishing Nevillac from ordinary coumarone resins.

Contain No Esters

Neville Resins contain no esters, are not saponifiable, and are water and alcohol-proof. They are unaffected by moderate concentration of acids, alkalies or salts, and saturation is relatively low, the iodine numbers ranging from about 45 for the high melting Nevindene grades to about 100 for the extremely soft grades. Due to their inertness, they are without effect on the cooking of varnish oils in the paint industry, having no power either to accelerate or retard bodying or geling of the oils.

When exposed in thin films to the action of oxygen or air and ultra violet light, these resins will undergo to some extent a complex oxidation reaction which results in their darkening or yellowing.

Considering briefly some of the more important uses of coumarone resins, these may be classed under Adhesives—Flooring



Heat polymerization resin unit. Still is at right.

Uses—Paint and Varnish—Printing Inks—Rubber Compounds—Chewing Gum—and Miscellaneous.

Regarding adhesive uses, the resins go into various types of binders and into cement; for instance in rubber cement, the solvent and latex types of cements are improved in adhesive strength by the use of coumarone-indene polymers. Then they find a large use in linoleum cement compounds in combination with some vegetable oils and oxidation products of vegetable oils.

As for flooring, they go into some floor varnishes and floor treatments, and in tremendous quantities into such products as mastic composition floor tile. This type of tile is seen everywhere now on the floors of post offices, schools and other public buildings and in offices, and the proper grade of coumarone resin is used in the amount of about 65 per cent. in the binder for this tile. The low price of the resin makes it attractive, also the fact that it has low tinting power and good alkali resistance and is easily compounded; and due to the fact that it is thermoplastic, there are no scrap losses and clippings can be worked up into further tile production. Certain types of animal or vegetable pitches, such as fish pitch or cottonseed pitch, are used to plasticize the resin, and then various mineral fillers, perhaps blast furnace slag or fibrous fillers are introduced, and pigments, and light colors and beautiful mottled effects are obtainable through the light colored binder resulting from the use of coumarone resin.

Paint, Varnish Uses

As for paint and varnish uses, there are a great many products here that coumarone resins enter into and they are particularly valuable in aluminum paint because they provide good leafing in ready mixed vehicles. Some of the less expensive vegetable oils, such as linseed oil, may be used in these aluminum formulas and no cooking of the resin and oil together is necessary because the resin doesn't react, consequently these formulas may be made as cold cuts. A number of solutions of these resins are also available using mostly coal-tar or petroleum solvents, to further assist the paint and varnish manufacturer who would normally cold cut the resin after receiving it. By purchasing the ready made resin solution in concentration and in the solvent he wishes, he is cutting out one of the steps in his manufacture and saving money. Inexpensive and long lasting pipe coating oils, which are really inexpensive varnishes, are also made and the use of coumarone resins here provides an oil that has better salt spray resistance and this is valuable because frequently these pipes are shipped for long distances in the holds or on the decks of ocean going vessels and must not rust before reaching their destination. As mentioned above, floor varnishes and floor treatment preparations ars made from coumarone resin, also concrete and cement coatings and these all profit by the alkali resistance of the resin; likewise, wall sealers and materials of that nature.

In printing inks, we find coumarone resins going into a number of types, including die stamping ink, and particularly rotogravure ink. The common brown rotogravure section would be made with an asphaltic type material, probably gilsonite, but colored sections, which at times are very beautiful, are made by using a high melting type of coumarone resin in a color that is pale enough to give the desired effect when pigmented.

In the rubber industry, coumarone resins are going into rubber cement, rubber heels, hard rubber products of various kinds, electrical tape, rubber tile, tires, etc., and in general the resins act as softeners to give easier milling and compounding and in extruding operations or rolling operations, such as rubber tile, they improve the flow. Some of the hard grades of resin are used in the hard rubber compounds to give gloss and also in some other rubber compounds to give gloss, and when large quantities are used, they provide stiffness, and the soft grades provide permanent tackiness in rubber adhesives such as used in electrical tape. Medium hard resin provides a deadening or leatherizing effect in rubber heels.

Two other very interesting uses are in chewing gum and in dental impression compounds. Specially processed grades of coumarone resin which have minimum odor, light color and practically no taste, go into the manufacture of chewing gum bases and while they are mainly used in making the bubble chewing gums, they are also being experimented with and finding their way into regular compounds for gum.

In dental impression wax, a very carefully controlled grade of coumarone resin is used because of its thermo plasticity, freedom from odor and taste, and these are the types of materials sometimes known as "bite blocks" which the dentists use to obtain impressions of the patients' mouth and teeth.

In mentioning highly specialized uses of resins, it is interesting to note a new but rapidly growing use of water-white cycloparaffin resins. In hospitals, medical schools, biological and other laboratories, Canada balsam and gum damar have been almost universally used in covering histological sections mounted on microscope slides. Damar and balsam have certain undesirable properties for this work, mainly their acidity and the fact that they yellow objectionably on aging on the slides. Two new resins—Clarite and Clarite "X"—do not have these disadvantages and are recommended as superior mounting media. Clarite and Clarite "X" are pure and clean, the Clarite is water-white, they are very high melting, inert, and have high refractive indices and excellent color retention. Clarite has a refractive index of 1.504 and is extremely color stable, whereas Clarite "X" has a refractive index of 1.567 and yellows to a very slight degree with age.

Toluene solutions of these two new white resins are available to the technician, and this is another case of the advantageous replacement of non-uniform, partially satisfactory natural resins by controlled uniform synthetic resins.

Summary

In summation, coumarone resins are soluble in a wide range of materials, including coal-tar solvents, petroleum thinners, chlorinated hydrocarbons, ketones, esters, drying oils, etc.; they are compatible with various rubbers and synthetic rubbers, such as chlorinated rubber, factice, etc., compatible with various waxes, natural resins, bituminous products and most synthetic resins, including such new products as polystyrene, and partial compatibility with ethyl cellulose. Three good things to remember about coumarone resins are these:—they are modern, versatile, and inexpensive.

Soya Wool

A process for the production of a wool from soya beans is reported from Japan. This wool, it is explained, is made from the glycinine of the soya, which has a chemical composition roughly comparable with that of keratin, the principal component of natural wool. About 37-40% of the soya is, moreover, glycinine, so that the process is quite economic. The beans are frequently used for the manufacture of oil, so that the wool can be made from oil cake normally used for cattle feed. The cake is ground up and treated with a weak solution of sodium hydroxide. This dissolves out the proteids, which are then precipitated by acid, and the precipitate can then again be dissolved in sodium hydroxide solution and spun in the usual manner. A somewhat similar system is also used for the manufacture of wool from fish, a source of raw materials of which the Japanese have large quantities.

Warp Sizes for Spun Rayon

Two easy-rinsing sizes for spun rayon yarns are being distributed by a New England textile specialty house. One of the materials is a dextrin-type product producing a smooth running yarn of high tensile strength, according to the manufacturer. The other is a complete treatment requiring no additional softening, penetrating or lubricating materials, it is said, and does not interfere with the application of special fabric finishes such as permanent or anticrease compounds.

CHEMICAL SPECIALTIES

Backyard gardeners are going scientific since the introduction of vitamin B^1 crystalline powder (Thiamine Hydrochloride). Treatment of plants with solution is said to increase foliage, produce larger blooms, increase vigor and substance, speed up growth. Garden Products Company, St. Louis, stresses item heavily with point of sale pieces including display card, counter carton, store posters.

INDUSTRIAL · HOUSEHOLD · AGRICULTURAL

CHEMICAL INDUSTRIES

F. W. Woolworth's famous Fifth Avenue Store

What

CHEMICAL SPECIALTIES

Do Chain Stores Buy?

NEARLY every kind of chemical specialty for household use can be and is being sold through the chain stores. Although the term "chain stores" as used here is intended to include such distributors as Montgomery-Ward and grocery chains like the Atlantic and Pacific, more particular reference is made to the so-called ten-cent stores typified by Woolworth's.

No doubt every manufacturer of household specialties would like to see his product sold through Woolworth's provided it is one that can be marketed at a suitable price level for such distribution. This means that it is highly desirable that the product can be manufactured and packaged to sell for 10 cents a unit, although with some products the minimum retail price is 20 cents. Very often two sizes of a product are sold, such as for 10 cents and 20 cents, 10 and 25 cents, 20 and 35 cents, or 20 and 59 cents. A few exceptions will be found even to the 20-cent minimum. The larger size is of course a break for the manufacturer as the cost of the container may be practically the same for the two sizes and may be a substantial part of the cost of the product at the minimum price level.

As to what the manufacturer will be paid for his product,—this is low in proportion to the retail price because Woolworth's operate with a very high overhead due to their relatively large floor space and high rent, their stores always being located in the most desirable shopping districts. The maximum paid for an item which retails for 10 cents is $9.00 a gross, which is 6¼ cents an item. This corresponds to a minimum gross profit to Woolworth's of 37.5 per cent. However, this margin is the exception, not the rule. To be attractive the product should sell for $8.40 a gross or less, allowing the store a margin of 40 per cent. or more. Many items sell for less than this, even in the chemical specialty field, where it is desirable to price the products as closely as possible. Because of their utilitarian nature, the housewife expects a great deal for her money as compared with her spending for something in the luxury class.

While Woolworth's may at one time have had a policy of selling one brand of a particular product, this is no longer true for the larger stores, which in some cases carry half a dozen brands of the same article. Among them is apt to be the best known brand of that product while the rest may have relatively unheard-of names. This leads to the appearance of two sizes of a product at the same

Production of chemical specialties is one thing, and your editors have, in the past, given you many articles covering all phases of the subject. But what happens after the specialty is ready to market? This article deals clearly with one phase of the ubiquitous merchandising problem.

Specialty Products Distributed Through Woolworth's

Product	Container	Retail price
Ammonia		
C. C. Parson's	10 oz. bottle	.10
W. brand (exclusive with Woolworth's)	(32 oz.) 1 qt. bottle	.10
Antifrost		
Veeco Mystic-Magic Antifrost (paste for windows and windshields)	small can	.10
Automobile Cleaner		
Karbath (speedy carwash, powder in cellophane)	for 3 washes	.10
Automobile Waxes and Polishes		
Johnson's Auto Wax (paste)	small flat can	.10
	2½ oz can	.20
Johnson's Carnu (liquid polish)	1/3 pt. can	.20
	1 pt. can	.59
Bleach		
Klean-new Chlorine Bleach	1 pt. bottle	.10
Cements and Glues		
McCormick Iron Glue (for glass, wood, etc.)	1¼ oz. bottle	.10
Testors Cement (for leather, wood, china)	small tube	.10
X-Pandotite (expanding cement)	3 oz. can	.25
	8 oz. can	.25
Deodorant		
Perfum-Air Room Deodorant (with holder)	small bottle	.25
Disinfectants		
Collin's Pine Oil Disinfectant	4 oz. bottle	.10
	12 oz. bottle	.20
CN Disinfectant	1 oz. bottle	.10
	4 oz. bottle	.25
Klenol Concentrated Disinfectant (phenol coefficient 3)	4 oz. bottle	.10
Silver Label Brand Germicide	2 oz. bottle	.20
(92% alcohol, essential oils)	4 oz. bottle	.35
Drain Pipe Opener		
Lightnin' (contains caustic soda)	8 oz. can	.10
Fabric Cleaners		
Carbona	1 oz. bottle	.10
DeLuxe	4 oz bottle	.10
Energine	2½ oz. can	.10
Floor Wax		
Aerowax (self polishing liquid wax)	16 oz. can	.20
Aero Dance Wax (shaker tine)	4 oz can	.10
All Nu (no rubbing, water-proof)	16 oz. can	.20
Collins Self-O-Lac (self-polishing)	6 oz. can	.10
	1 pt. bottle	.20
Johnson's Glo-coat (self-polishing)	3 oz. can	.10
	1/3 pt. can	.20
	1 pt. can	.59

(Continued on page 470, col. 2)

price, as will be commented on in a later article.

A list of chemical specialties for household use which are sold in a large New York City Woolworth store has been compiled. This list of course changes from time to time but it shows the manufacturer, in a general way, the names he has to compete with and the prices he has to meet or better, in order to get his product into this field of distribution. From the comprehensiveness of the list it would appear that any household chemical can be placed in the ten-cent store if it will sell.

Some Items Not Carried

The smaller ten-cent chain stores do not have the space to carry all of the items listed in the adjacent columns, nor do the grocery chains. However, both carry some of the same items and a number of the same classes of products. A survey of a smaller ten-cent store and of a typical Atlantic and Pacific store showed the following specialties in stock:

Specialty Items	Number of Brands Stocked: Kress 10-Cent Store	A & P
Ammonia	0	1
Cements and Glues, Household	3	0
Disinfectants	0	1
Drain Pipe Opener	0	1
Fabric Cleaners	3	1
Floor Wax	2	3
Furniture Polish (including lemon oil)	1	2
Glass Cleaner	1	1
Hat Cleaner (powder)	1	0
Insect Powder	1	3
Insect Spray	0	3
Mouse and Rat Poison	0	1
Paints, Enamels, Varnishes	3	0

Above are shown some of the chemical specialties sold in large volume by variety chains.

Paraffin	0	1
Putty	1	0
Rug and Upholstery Cleaners	2	0
Rust Remover	1	0
Silver Polish	1	3
Stove Polish	0	3
Toilet Bowl Cleaner	1	1

A comparison of these two sets of figures shows that for some specialty items the housewife is accustomed to shop in the ten-cent store, while others she considers to be grocery-store items—household cements,—paints, enamels, varnishes, and rug and upholstery cleaners being examples of the non-grocery store type. On the other hand, insecticides, silver polish, and stove polish fall more predominantly in the grocery-store class. Scouring powders such as Bon Ami, Old Dutch Cleanser, Sapolio, Kirkman's, Octagon, etc., and compounded soaps such as Oxydol, Rinso, Chipso, Supersuds, etc., are distinctly grocery store items. Often a dozen brands of such products are found in the chain grocery. A few products have become so well known in their own special field that they are apt to be carried in all the types of chain stores, an example of this being Sani-Flush. Discussion of the merchandising of these products will be dealt with more specifically in an article to follow. Problems involved in selling and satisfying the chain organization are no insignificant matter.

Product	Container	Retail Price
Johnson's Liquid Wax (requires rubbing)	2½ oz. bottle	.10
Johnson's Paste Wax	3¾ oz. can	.20
Old English (liquid, no rubbing)	6 oz. can	.20
Old English Paste Wax	flat can	.10
Woolco Self-Polishing Wax	1 pt. can	.20
	1 qt. can	.35
	½ gal. can	.65
Furniture Polish		
(Many of the liquid waxes say for floors and furniture)		
Aero Polish (2 layer liquid)	8 oz. bottle	.20
Aero Scratch Remover and Polish	4 oz. bottle	.10
Collin's Household Polish	8 oz. bottle	.10
	1½ pt. bottle	.20
Collin's Lemon Oil Polish	8 oz. bottle	.20
	1½ pt. bottle	.20
Collin's Lustre-Lac Polish	6 oz. bottle	.10
	16 oz. bottle	.20
Johnson's Blem (for treating rings and scratches)	1½ oz. tube	.20
O-Cedar Polish	1½ oz. bottle	.10
Glass Cleaners		
Collin's Kleerpane	small bottle	.10
	1½ pt. bottle	.20
Dob-ene (for glasses)	½ oz. bottle	.10
Opto (for sparkling eyeglasses)	small tube	.10
Wet me Wet (powder in flannel bag)	small bag	.10
Insect Powder		
Antded (100% pyrethrum powder in shaker can)	1½ oz. can	.10
Black Flag	¾ oz. bottle	.15
El Vampiro (80% pyrethrum powder in bellows box)	¾ oz. box	.10
Flit powder (94% pyrethrum, 1% tuba, shaker can)	¾ oz. can	.10
Fly Ded (refillable bellows can)	½ oz. can	.15
Flyded (100% commercial insect powder, shaker can)	¾ oz. can	.10
J-O Insect Powder (bellows can)	small can	.10
Insect Spray		
Black Flag	16 oz. can	.25
Bug Ded (spout can)	6 oz. can	.10
	16 oz. can	.20
Flit	6 oz. can	.10
	16 oz. can	.25
Fly Ded (100% active ingredients)	6 oz. can	.10
	16 oz. can	.20
Lighter Fluid		
Kwik-Lite (for cigaret lighters, spout can)	4 oz. can	.10
Lubricating Oil		
Ever-Ready Machine Oil (spout can)	4 oz. can	.10
Nye's Household Oil	4 oz. bottle	.10
3-in-one Oil (bellows spout can)	1 oz. can	.10
	1 oz. bottle	.10
No. 857 Lubricating Oil (not a blend, spout can)	12 oz. can	.20
Metal Polish		
Grady's Liquid Scouree Polish	6 oz. can	.10
Rub-less Polish	3 oz. can	.10
	6 oz. can	.20
Moth Killers		
Mothalene (can to be perforated and hung in closet)	8 oz. can	.25
Odora Motholator	7 oz. can	.20
Odora Paradichlorobenzene (crystals)	12 oz. box	.20
(tablets)	12 oz. box	.20
Naphthalene Moth Balls	1 lb. box	.10
Handy Vaporizer (pure paradichlorobenzene)	3 oz. can	.10
(Odora perfumed cakes and crystals are also sold in various forms. Also sold are Pine tar paper and mothproof storage bags.)		
Mouse and Rat Poison		
Ridmice (in seed form, contains strychnine sulfate)	1 oz. box	.10
Q. A. Ratabs (contains red squill)	9 tablets	.10

New Products

Coating Liquids

A coating liquid recently developed to round out a line of corrosion resistant materials is being sold under the tradename of "Alkalon." It has been found to be especially applicable to protection of latex tanks and other equipment handling latex. The advantage of this material is said to lie in the fact that it is resistant to alkalies, produces a hard surface, and is very smooth and glossy, thereby preventing the adherence of the latex coagulate. For best results, the company recommends two or three coats of the "Alkalon" material. This material can be thinned with xylol solvent. A gallon covers from 400 to 500 square feet, depending on surface conditions. *Rubber Age*, February, 1940.

New Electrolytic Process

A manufacturer of stainless steel castings, valves, fittings, etc., now offers its products finished by a new, patented electrolytic process known as "Lustracast."

The process is not surface coating but an electrolytic bath that not only cleans and brightens plain and ornate surfaces but provides smoother surface—affording less chance for surface contamination and contact corrosion. The process also improves machinability owing to a more uniform removal of scale, and "salt spray" tests indicate a considerable advantage over sandblasting and pickling methods in corrosion resistance.

Paraffine Wax Emulsifier

Development of a paraffine wax emulsifier for use in all kinds of processes and products where wax is needed has recently been announced. This new emulsifier, named NOPCO 2251, is a heavy, tan colored paste that is mixed with paraffine wax to make the wax water dispersible or emulsifiable. It is a chemically compounded material which, upon rendering the wax water soluble, is capable of producing a stabilized emulsion spontaneously and without the application of energy in the form of rapid agitation or shearing effect for example as obtained in a colloid mill. In the use of this emulsifier no special equipment is necessary.

Product	Container	Retail Price
Paints, Enamels, Varnishes		
Aluminum paint (exclusive with Woolworth's)	2 oz. bottle	.10
Dur alustre Enamel (exclusive with Woolworth's)	8 oz. can	.25
	16 oz. can	.50
Enamel-on (in assorted colors)	4 oz. jar	.20
	1 pt. can	.75
Gold paint (exclusive with Woolworth's)	2 oz. bottle	.10
Orange shellac (exclusive with Woolworth's)	2 oz. bottle	.10
	6 oz. bottle	.25
People's Bakelite Linoleum Varnish (floor, exc. W.)	12 oz. can	.25
(spar exc. W.)	12 oz. can	.25
People's Prepared Paint (exclusive with Woolworth's)	5.3 oz. can	.10
	16 oz. can	.25
Rookwood Quick-Dry Enamel (assorted colors)	4.2 oz. can	.10
	12 oz. can	.25
	26 oz. can	.50
Varnish Stain (exclusive with Woolworth's)	5.3 oz. can	.10
	16 oz. can	.25
Wipe-on Varnish	4 oz. bottle	.20
	16 oz. can	.75
(Also, show-card colors)	2 oz. jars	.10
(oil colors)	small tubes	.10
Paint and Enamel Cleaners		
Dic-A-Doo Paint Cleaner (in paper envelope)	2 oz.	.05
	1 lb. box	.25
Povar Enamel Glow (Cleans enameled wood and metal)	1 pt. bottle	.20
Paint and Varnish Remover		
Radiant (contains more than 15% benzol)	6 oz. can	.10
	1 pt. can	.20
Paraffin		
Gulfwax (¼ lb. per box)	3 boxes	.10
Plastic Wood		
Plastic Wood	¾ oz. tube	.10
Radiant E-Z-Wood	4 oz. can	.10
Putty		
Radiant	1 lb. can	.10
Rug and Upholstery Cleaners		
Magicleaner	1 pt. can	.25
Nuvo Shampoo (soapless)	½ oz. tube	.10
Rug Backing		
Sta-Tite (prevents rug slipping)	3 oz. bottle	.25
Rust Remover		
Zud (in shaker can)	2 oz. can	.10
Scouring Powder		
Babbitt's Cleanser	14 oz. can	.05
Silver Polish		
Electro-silicon Polishing Cream	4 oz. can	.10
Glad Rag	2 sizes	.20 .10
Noxon (really a metal polish)	3 oz. bottle	.10
	½ pt. can	.20
Stove Polish		
Black Beauty	2½ oz. can	.10
Toilet Bowl Cleaner		
Lightnin' (contains bisulfate of soda)	10 oz. can	.10
Sani-Flush (contains bisulfate of soda)	10 oz. can	.10
Turpentine		
Radiant Steam-distilled Wood Turpentine	6 oz. can	.10
	16 oz. can	.20
Steam-distilled Wood Turpentine	6 oz. can	.10
Water Softener		
Collin's Aqua Softener	12 oz. box	.05

Tung Oil De-Odorized

A new method for the successful and economic removal of the natural odor of tung fruit from tung oil has been developed. Oil so treated may be obtained with a neutral odor or with specified odors. It is claimed that recent tests, made over a sixty-day period, indicate that the de-odorized oil retains its properties and does not revert back to its original odor.

Purified Titanium Dioxide

A company specializing in chemicals for the cosmetic industry has recently announced the production of a purified Titanium Dioxide, certified to contain not more than 20 parts lead nor more than 2 parts of arsenic per million. This material is of great importance in the manufacture of face powder, lipstick, nail preparations, and other cosmetics. It is also thought that there may be other applications where a Titanium Dioxide having such purity may be helpful, such as in catalysis. In spite of the purity this material is said to be reasonably priced.

"Griptite" Cement

This new product is said to have excellent cohesive and adhesive properties. It is claimed that "Griptite" will stick any kind of rubber to any kind of metal, as well as concrete, Bakelite, polished marble, and fabrics. It is waterproof, contains an anti-oxidant and will not deteriorate with age. It is said that the longer it sets the more tenacious it is. "Griptite" is sold in all sized containers from one ounce to fifty-five gallons.

New Fire Hose Gaskets

The use of Koroseal, rubber-like material, and for which the basic materials are coke, limestone and salt, has again been broadened, it is announced by the manufacturer.

Newest products made from Koroseal are swivel gaskets for both municipal and industrial fire hose. Use of the new material for this purpose has the following advantages which ordinary rubber gaskets do not possess, the manufacturer claims: The smooth glaze on the surface of Koroseal eliminates the need for spanner wrenches, and makes it possible to tighten couplings using the new gaskets by hand so they are leakproof at internal pressures up to several hundred pounds.

Because they do not harden with age or lose their resilience, the Koroseal gaskets will outlast rubber gaskets many times.

Locking and freezing of swivels are eliminated, since the Koroseal gaskets contain no sulfur or other compounding ingredients which result in corrosion or oxidation through contact with the coupling metal.

There being practically no water absorption by Koroseal as compared to the absorption by rubber, the new gaskets do not swell or lose their shapes.

New Molding Material

A new, easily performed, high-impact phenolic molding material has recently been announced. This molding compound, known as Durez 1900 Black, delivers an unusually smooth finish for a standard high-impact type. It is unique in its particle size and shape through which it is given its excellent performing properties. The particle size is so controlled that Durez 1900 Black flows through hoppers and automatic feeding devices easily. For this reason it has been found suitable for many parts requiring a high-impact material which had previously been considered impractical for molding.

ADVERTISING PAGES REMOVED

CHEMICAL SPECIALTY *News!*

N.A.I.D.M. Circularizes Membership on New Standard Specifications for Disinfectants—Hilo Releases New Finishes—Company News

National Association, Insecticide & Disinfectant Manufacturers is now circularizing membership on new standard specifications for disinfectants taking into consideration acids from petroleum sources. Approval is sought from a majority of the membership, after which they will be sent to the Bureau of Standards for promulgation.

Because disinfectants produced from certain fractions of the new acids show properties not associated with coal tar derivative disinfectants, specifications are divided into two groups headed "Phenolic Disinfectant, Soluble Type."

Group A covers cresylic disinfectants with phenol coefficients of 2 to 5, practically identical with cresylic disinfectant specification now in effect, while Group B covers soluble disinfectants with phenol coefficients over 5, to take care of disinfectants made from higher boiling fractions of acids from petroleum.

Specifications for Group B phenolic disinfectants with phenol coefficient over 5 follow:

GENERAL REQUIREMENTS

The product shall be made from phenolic acids of coal tar, petroleum or synthetic origin, and a soap derived from rosin acid and/or fat and/or oil of vegetable origin.

It shall contain not less than 50 per cent. of phenolic acids.

It shall contain not more than 25 per cent. by volume of inert ingredients (water plus glycerine and organic solvents, if any).

The phenol coefficient shall de determined by the Food and Drug Administration Method using B. typhosus as the test-organism and shall be clearly stated on the label attached to each shipping container.

It shall contain less than 5% of benzophenol.

It shall make clear solutions with water of zero hardness at 20° C. (68° F.) at concentrations of 2% or less. Such solutions, when kept in closed containers, shall remain either practically clear or become only slightly opalescent when allowed to stand for 24 hours at 20° C. (68° F.) away from direct light.

It shall show no soap separation when cooled down to 0° C., and held at this temperature for 3 hours.

CERTIFICATION AND LABELING FOR GROUP B

The following form of statement on labels, invoices, etc. is recommended:

"The ———— Company certifies this phenolic disinfectant, soluble type, to conform to all requirements of the standard adopted by the NATIONAL ASSOCIATION OF INSECTICIDE AND DISINFECTANT MANUFACTURERS, INC., and recorded as Commercial Standard CS71, *Group B*, by the National Bureau of Standards of the U. S. Department of Commerce."

When used on labels the above statement is in addition to, and not in lieu of, the ingredient statement required by the Insecticide Act of 1910.

Hilo Releases New Items

Hilo Varnish Corp., Brooklyn, has released two new finishes, Vitra-Carlite Hammerkraft and Vitra-Carlite Spatter. Products were specially designed for use on circulatory heaters, coal, oil furnaces, hot water heaters, stove shells, etc.

Hammered and spatter effects are easily obtained, according to manufacturers, requiring two spray operations, but only one bake at 300° F. for 20 minutes.

Gulick Plans Day At Fair

Charles P. Gulick, president, National Oil Products, Harrison, N. J., has declared May 24 a plant holiday so that all employes can visit the New York World's Fair. Gulick announced that the company, the first non-exhibitor at the fair to set a special day for company participation, will pay expenses of employes to and from the exposition.

"I think every big industrial firm in the state should co-operate in setting aside a special day for World's Fair co-operation," Gulick stated. "From a purely educational standpoint, I think the fair is the greatest exposition ever staged."

Baertex, new abrasion-resting enamel, is now available in 21 other colors besides traditional Battleship Gray. High gloss enamel coating was developed for use on concrete floors, but can be used on walls where hard usage is necessary. Synthetic enamel is said to have average covering power of 600 to 700 square feet per gallon. Baer Brothers, N. Y. City manufacturers are sole distributors.

Moore Talks On Resins

Robert J. Moore, Development Manager, Bakelite Corporation, Unit of Union Carbide and Carbon Corporation, addressed American International Academy on the subject of "Synthetic Resins in the Paint and Varnish Industry," at Loyola College with Dr. V. A. Ryan, Head, Section on Chemistry, in the chair.

N.A.I.D.M. Sponsors Research

N.A.I.D.M. Governors' Board meeting in N. Y. City appropriated $1,200 to continue work at Ohio State on evaluation of insecticides, liquids, and powders against crawling insects. Board also appropriated $300 to initiate Disinfectant Research project covering prevalence of harmful bacteria in public places.

Latter appropriation, it is pointed out, covers only first steps. Further, more extensive research work aimed to promote use of disinfectants is planned, according to W. B. Eddy, chairman, research program committee. Project is scheduled to begin at once at University of Rochester.

Perfex Begins Production

The Perfex Company, 1530 Center Street, Tacoma, Wash., is now in operation manufacturing "Perfex," a deodorant, cleanser and bleach. J. Arthur Thompson heads the company.

Continental Can Sales Up

Continental Can sales are over 15 per cent. ahead of corresponding '39 period, Carle C. Conway, board chairman, declared at stockholders' annual meeting. No changes were made in directorate.

Silver Seal Opens Plant

Silver Seal Products, Inc., has begun manufacturing X-O-X, bleach-cleaner, in new plant at Barnsdall, Okla. Harold Adkins is manager.

Marshall Discusses Lacquers

W. R. Marshall, Coatings Laboratory, The Resinous Products & Chemical Co., discussed "High Alkyd Lacquers" before Western N. Y. Paint and Varnish Production Club, Buffalo.

Columbia Starts Manufacturing

Columbia Insecticide Co., 104 South Front Street, Hudson, N. Y., begins manufacture of complete line industrial insecticides. Alex Mazaica is chemist, with Paul W. Maynard as sales manager.

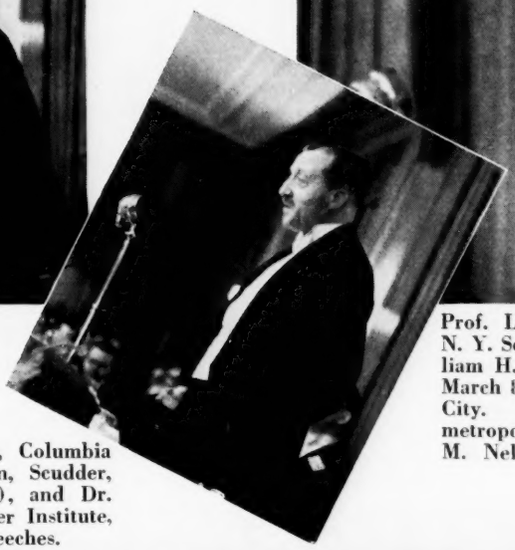
Kelco Leases Plant Site

Kelco Company has taken long term lease on Ventura, Cal., factory site, plan building at new $1,750,000 harbor.

Hudson Exterminating Moves

Hudson Exterminating Co. has moved its laboratories and offices to 444 Eighteenth Street, West New York, N. J.

Nichols Medal Meeting



Prof. Marston T. Bogert, Columbia (left), Dr. D. P. Morgan, Scudder, Stevens & Clark (center), and Dr. John Northrop, Rockefeller Institute, delivered introductory speeches.

Prof. Louis P. Hammett, chairman, N. Y. Section, A.C.S., presided at William H. Nichols Medal Meeting held March 8 at Hotel Pennsylvania, N. Y. City. Three hundred scientists of metropolitan area honored Prof. John M. Nelson, Columbia, '40 medalist.

★

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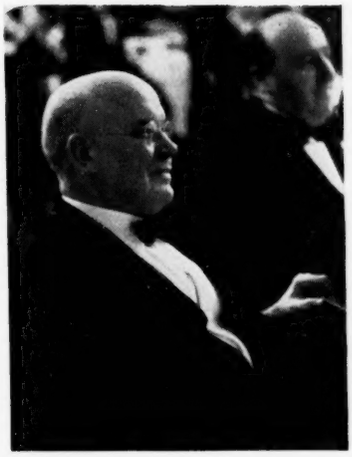
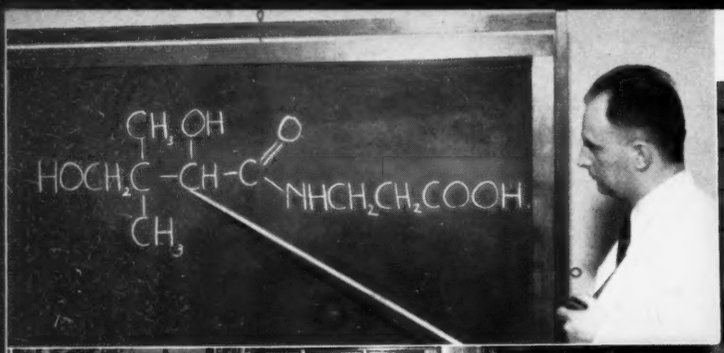
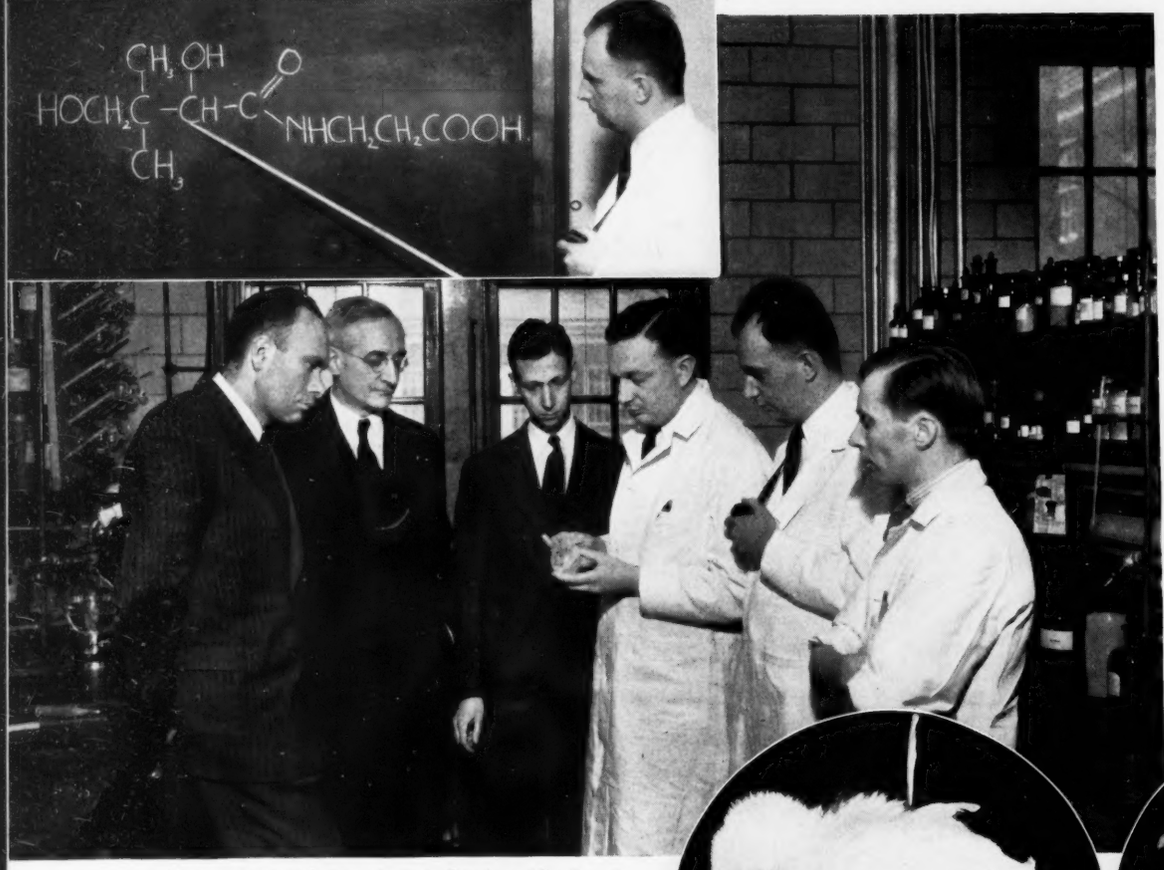
Here is climax of Nichols Dinner, with Prof. John M. Nelson, Columbia, delivering annual address on "Some Plant Oxidases" after medal had been presented to him. Prof. Bogert (back to camera) looks on. Beyond Prof. Nelson is Dr. Cornelia T. Snell, secretary of medal jury.



Left — Dr. Floyd J. Metzger, vice-president, Air Reduction Co., with Dr. Robert E. Wilson, president, Pan American Petroleum & Transport.

Right — Prof. W. C. MacTavish (left), head, Chemistry Department, Washington Square College, N. Y. U.; W. W. Winship, Thermal Syndicate.



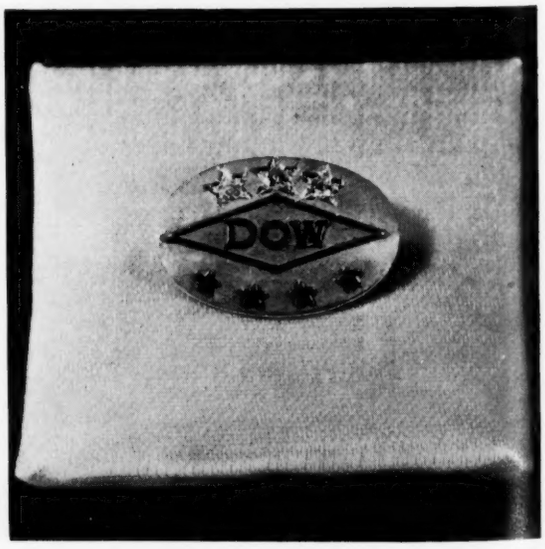


Successful synthesis of pantothenic acid, vitamin believed present in all living tissues, has been accomplished in Merck laboratories by Doctors E T. Stiller, J. C. Keresztesy, and J. Finkelstein. Inset at top shows Dr. Keresztesy pointing out complicated structure of new vitamin, made up of carbon, hydrogen, oxygen, and nitrogen. Below (left to right), Dr. Randolph T. Major, Merck research director; Dr. William H. Engels, associate director; Dr. Karl Folkers, assistant director; Drs. Finkelstin, Keresztesy, and Stiller.

Chicks, below, of same age were used in experiments on pantothenic acid. One on left was maintained on acid free diet, other's diet contained substance.

Left — Dr. Jacque C. Morrell, associate research director, Universal Oil Products, speaking on "Chemistry and the Petroleum Industry" before N. Y. Chapter, A.I.C. meeting at Chemists' Club. He stressed importance of research in industry, and executive need for knowledge of patents and legal forms.

Below—Dow employees with more than 20 years' service received pin in recognition of their loyalty. Diamond stars at top each represent five years' service in addition to 20 years represented by stars at bottom. Employees with 20 years' service received pins without the diamond; 16 who have been with Dow 35 years or more received gold watches.



Any Lines to Untangle?

Only too frequently in both research and process development the "lines of attack" are hopelessly tangled.

The product or products you have made for a specific use may not act exactly as expected. Introduction of an amyl or butyl group may be the answer to your "knotty" problem.

Or . . . your optimum product may be difficult to make commercially from the same raw materials that were used in the laboratory. One or more of the 100 Sharples Synthetic Organic Chemicals may "unsnarl the line". If not, let us see whether we can synthesize one that will.

*Pentasol (Pure Amyl Alcohol)
*Pent-Acetate (100% Amyl)
Normal Butyl Carbinol
Isobutyl Carbinol
Sec-Butyl Carbinol
Diethyl Carbinol
Dimethyl Ethyl Carbinol
Tertiary Amyl Alcohol
*Pentaphen
(p-Tertiary Amyl Phenol)
Diamyl Phenol
Ortho Amyl Phenol
Monoamylamine
Diamylamine
Triamylamine
n-Monobutylamine
n-Dibutylamine
n-Tributylamine
Monoethylamine
Diethylamine
Triethylamine
Monoamyl Naphthalene
Diamyl Naphthalene
Polyamyl Naphthalenes
Mixed Amyl Naphthalenes
Normal Amyl Chloride
Normal Butyl Chloride
Mixed Amyl Chlorides
Dichloropentanes
Amyl Mercaptan
Diamyl Sulphide
*Pentalarm
Amylenes
Diamylene
Amyl Benzenes
Diamyl Ether
SEMI-COMMERCIAL PRODUCTS
LABORATORY PRODUCTS
*Trade Mark Registered

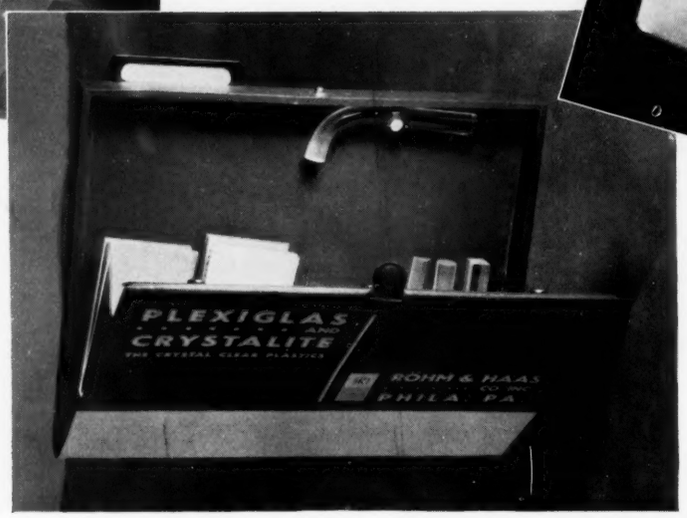
THE SHARPLES SOLVENTS CORP.
PHILADELPHIA
CHICAGO NEW YORK

SHARPLES TRADE MARK SOLVENTS

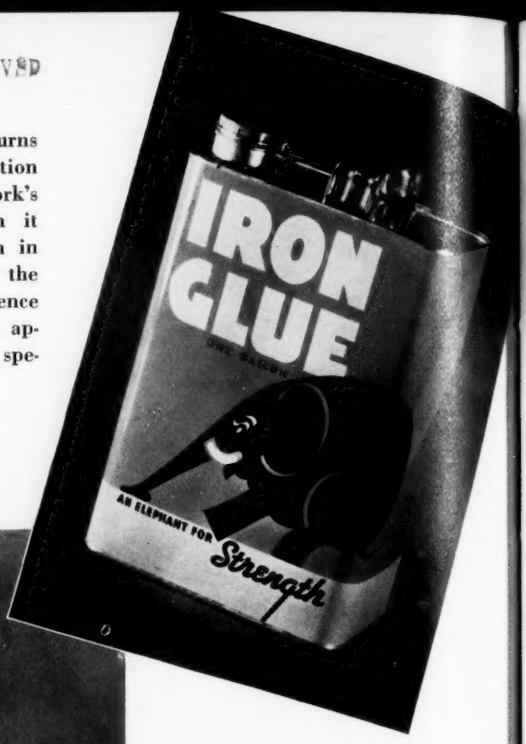
Wolf Awards

In the Spring, industry's fancy turns seriously to the Packaging Exposition being held this year at New York's Hotel Astor. Show brings with it Wolf Award package competition in which outstanding containers of the year receive due acclaim for excellence in design, utility, merchandising appeal. Three winners in chemical specialties field are shown here.

Ruxtone artist oil tubes display received award as counter display piece most effectively contributing to selling of unit package. Ruxton Products, Inc., uses it.



Rohm & Haas package sampling plastics was judged most effective package designed to add to consumer convenience regardless of artistic qualities.

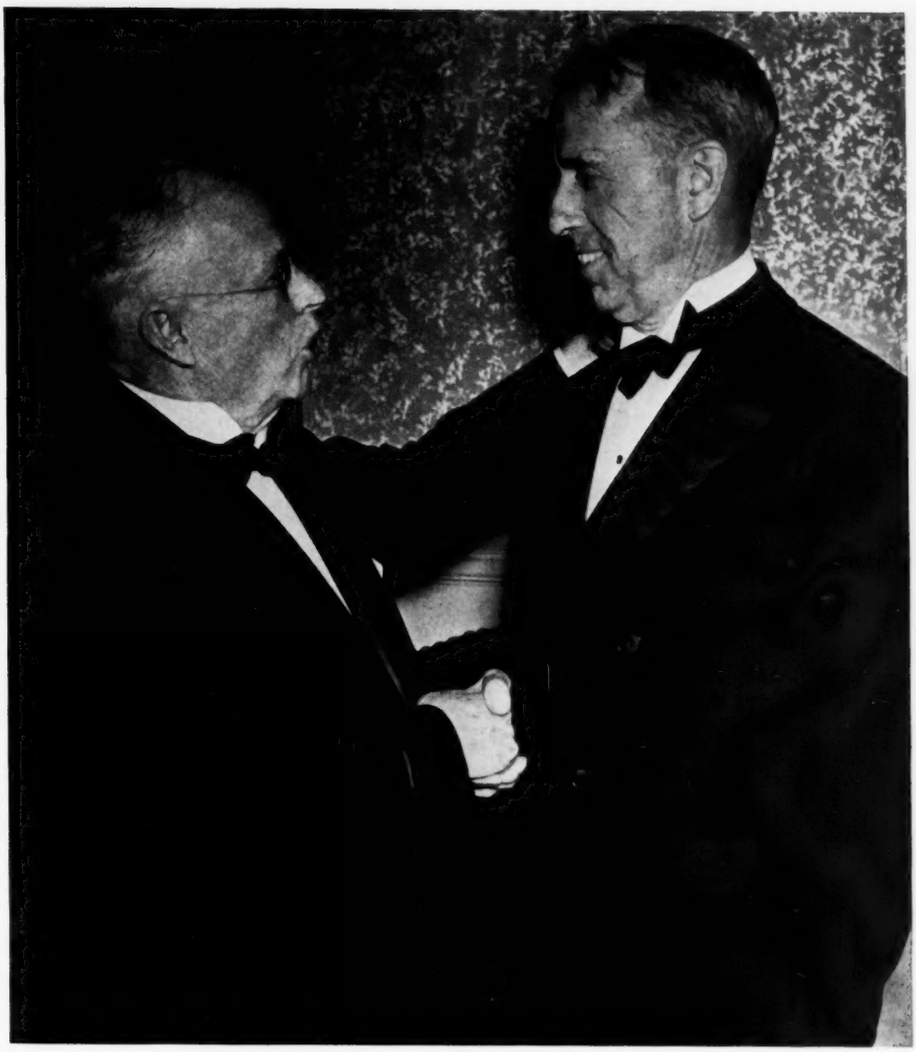


Because of its effective use of elements of design to create shelf visibility in retail store, Iron Glue container used by McCormick & Co. romped off with an award.

William H. Adams, Jr., technical director, Haveg Corp., was host to 85 Philadelphia-Wilmington Junior Chemical Engineers who visited plant at Marshallton, Del., recently. Some of the visitors, all members, Philadelphia-Wilmington Section A.I.Ch.E., are shown at plant. Haveg Corp. is a subsidiary of The Continental Diamond Fibre Co.

Hugh M. Corrough was recently appointed manager, Alco Products Division, American Locomotive Company. He has been with Alco Division since June, 1936, serving in capacities of chief mechanical engineer, assistant manager of engineering, and manager of engineering. He occupied latter position when appointed to full managership.

NEWS OF THE MONTH



Honored by Case School of Applied Science

James T. Pardee, co-founder and chairman of board, Dow Chemical Co. (left), and W. J. Austin, president, The Austin Co., received honorary degrees from Case School of Applied Science at its 60th anniversary Founders' Day Convocation. Mr. Pardee received degree of Doctor of Commercial Science as "a pioneer in creation of a great industry . . . guiding its fiscal operations with high integrity." Mr. Austin became Doctor of Engineering for his contribution to "housing of industry."

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IN REVIEW

CHEMICAL INDUSTRIES

'POLITICAL FARMERS' FLAYED BY LANDIS

Cyanamid Vice-President Tells Chemurgy Meeting Farmers Should Direct Experiment Stations Instead of Politicians—McMillen Traces Chemurgy Achievements—Dean Lind Presides at A.C.S. Meeting—H. A. Galt Retires—Queeny Suggests Recovery Plan

DR. Walter S. Landis, Cyanamid vice-president, in an address before the National Farm Chemurgic Conference in Chicago, urged farmers to take over active direction of experimental stations, other service units now operated under government supervision. "They are just as much your tools as your plough," he declared, "and will best serve under the influence of your thought and direction."

Tracing the growth of agriculture from pre-historic times, Dr. Landis drew a speculative picture of how the idea of planting and domesticating animals for self-sustenance was born. This discovery marked the beginning of progress, he declared, because it released men from constant occupation with hunting for self-preservation. This opportunity to think—to research—marked the beginning of civilization, he declared. All we possess and enjoy beyond the average of primitive man is founded on the directed evolution of the science and art of agriculture.

Dividing the progeny of this first progressive man, Dr. Landis set up three "purely arbitrary" groups, namely:

1. Agriculturalists in the broadest sense.
2. Artisans, tradesmen, engineers.
3. Politicians, including all concerned with the functions of government, from ward leaders through emperors to dictators.

Discussing the current plight of farmers, the speaker said:

"Perhaps this agricultural group has been too conservative, too bound by precedent, too provincial. Perhaps the farmer has not been active enough in advising direction of the activities of his research institutions, and has been satisfied with too much agronomy and too little farm economics. Perhaps he individually has paid much too little attention to the fact that there are strong urban groups in our Group Two, that have intentionally or not, thrown the whole economic system out of balance through thoroughly selfish motives, and to the farmers' great disadvantage. Perhaps he has been too busy to dig under the veneer of our Group Three and find the Tartar who has been taking him for a grand ride for generations back. In fact he has been far too meek and tractable, in my humble opinion, and has let Groups Two and Three force his particular welfare into the background."

Should Study Cooperation

Going on to discuss the cleavage between industry (Group 2) and the farmer, he said there has been too little of the leisure made available by our farming ancestors spent in the study and rectification of social inter-relationships of these first two groups.

The Third Group in his arbitrary classification includes those in governmental service and those "leaders" more or less responsible for their selection. "In the old days," Dr. Landis points out, "this was not a numerous group, but in our modern times, it represents a very large proportion of the population. If this tendency continues at recent rates, the majority of our peoples will become non-productive in our economic system."

"This group," he declared, "is using the farm provided leisure for his own ends. Too much of this spare time has been devoted to formulating mentally dishonest legislation. All over the world there has been not only a decline in legislative morality, but too often a complete dissolution and replacement by autocratic edict."

"Our Group Three has tossed you into a deep hole; it hopes you will stay submerged and permit it free rein. It is time you return to old principles, develop new leaders and advisers. Make our Third Group your menial servants, but do your own thinking, your own investigating, your own researching."

Wheeler McMillen Talks

Another highlight of the Chemurgic meeting was opening session address by Wheeler McMillen, president of the Council, who traced the achievements of chemurgy over the past 15 years. These years, he said, have seen abundant demonstration of the soundness of the chemurgic idea.

Under its guidance, the woodpulp industry has expanded tremendously; tung oil industry has grown steadily in its limited area along the Gulf Coast; cigarette paper manufacture has come to America for the first time using 10,000 tons of domestically grown flax in the past year.

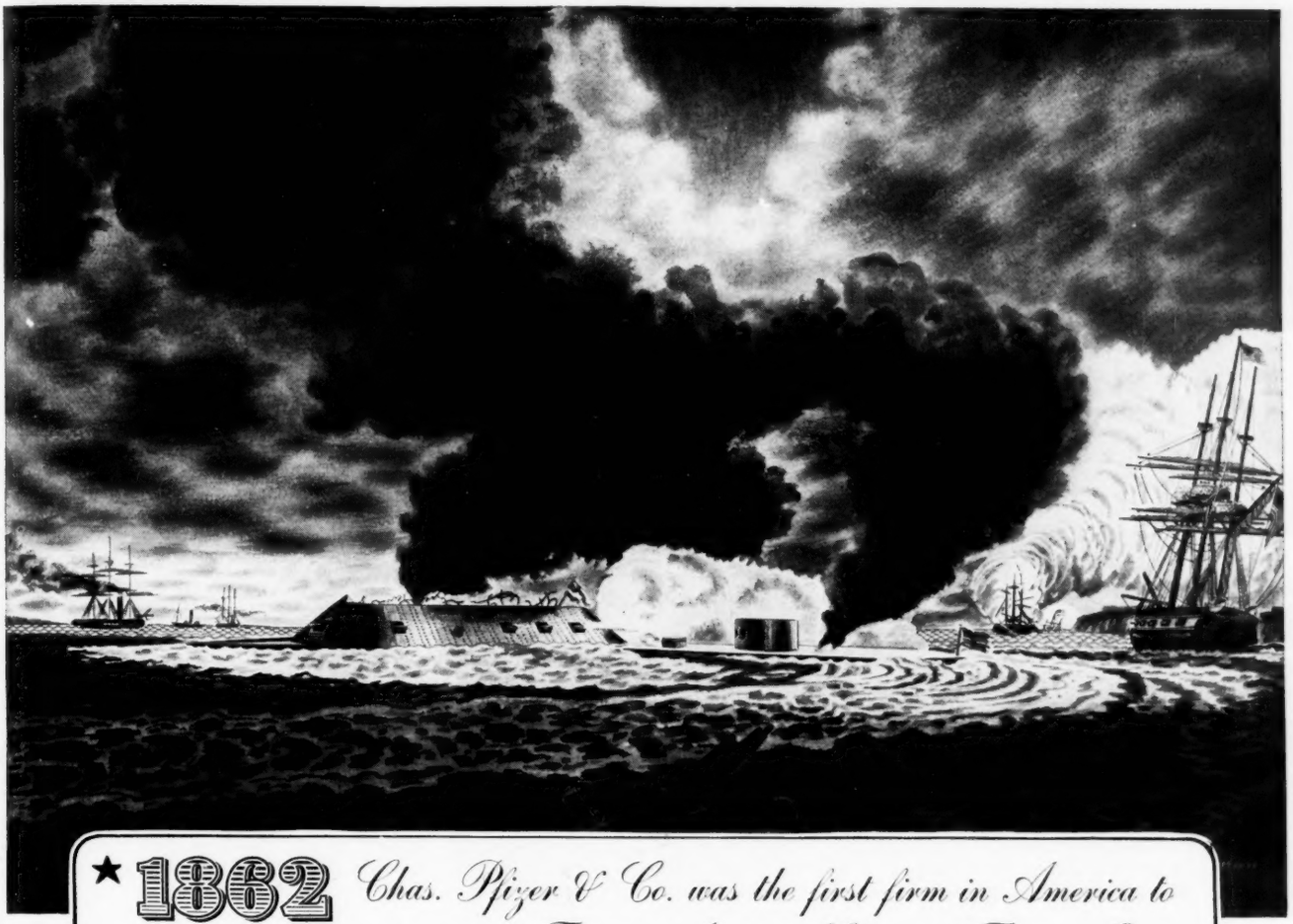
Among other achievements of chemurgic program listed were starch made

Continued on page 484, *Col.* 1

Speakers' Table at opening session of Farm Chemurgic Conference in Chicago. Left to right: Louis J. Taber, Master, The National Grange, Columbus, Ohio; General Robert E. Wood, Chairman of the Board, Sears, Roebuck & Co., Chicago; Wheeler McMillen, President, National Farm Chemurgic Council, Columbus, Ohio; Fowler McCormick, Vice-President, International Harvester Co., Chicago; Paul Clapp, Vice-President, Columbia Gas & Electric Corp., Columbus, Ohio.

1862* FIRST MEETING OF IRONCLAD SHIPS

Ending the Era of Wooden Ships



★ 1862 *Chas. Pfizer & Co. was the first firm in America to undertake the manufacture of Tartaric Acid and Cream of Tartar—Ending the era of foreign monopoly of American markets for these products*

¶ Until the 1860's, the tartaric acid and cream of tartar used in this country were imported, principally from France. Chas. Pfizer & Co. began the manufacture of tartar products in 1862, believing that the general use of these products in American foods and medicines demanded a higher standard of quality than had yet been attained in Europe.

¶ Today, Chas. Pfizer continues to emphasize quality. Throughout its ninety years of existence, this firm's fine reputation has been built on strict adherence to high standards of quality, purity, uniformity.

CHAS. PFIZER & CO., INC.

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MANUFACTURING CHEMISTS SINCE 1849

Continued from page 482, Col. 3.

from sweet potatoes; castor bean production; researches into wastes of milk; and doubling production of soybeans, which aided the cornbelt considerably last year.

L. F. Livingston, Du Pont, urged farmers to spend more of its income on research. "Agriculture," said Mr. Livingston, "spends on research only about one seventh of one per cent. of the value of agricultural products. This includes all the money put in by the government, all the money going into state experimental stations, and everything else that we could possibly put into that figure. On the other hand, the manufacturing industry as a whole spends approximately one half of one per cent. of its gross sales revenue on research."

Other speakers were: Donald L. Gibb, Dow Cellulose Products Division; Dr. R. T. Milner, Director, U. S. Regional Soybean laboratory; John H. Gellert, plant manager, American Casting Service; K. J. Seulke, A. E. Staley Mfg. Co., research director; Dr. Carlile P. Winslow, director, Forest Products laboratory; E. J. Hoddy, president, American Railway Development Association; Dr. W. L. Burlison, Illinois University; Herman F. Willkie, production vice-president and Paul J. Kolachov, research director, Joseph E. Seagram & Sons; D. Howard Doane, Doane Agricultural Service; Dr. W. C. Gangloff, chemical director, The Drackett Company; Clinton T. Revere, Laird, Bissell & Meeds; and H. H. Schopmeyer, research director, American Maize-Products Company.

General Session Opens A.C.S.

Nation's chemists assembled at Cincinnati last week for ninety-ninth A.C.S. meeting. Program began Monday afternoon in the Netherland Plaza Hotel, continuing through Friday. Nearly 450 papers and addresses in seventeen major fields were delivered at fifty-six sessions opening with a general meeting.

Papers covered such subjects as utilization of agricultural wastes, the freeing of this country from foreign resources, expansion of synthetic industrial chemistry, vitamins and nutrition, the chemistry of sulfanilamide and its derivatives, scientific education, electrical insulation, cellulose and organic plastics, individual and community welfare, and the conservation of national riches.

Speakers at opening general session Monday at 2 o'clock at which Dean Samuel C. Lind, A.C.S. president, of the University of Minnesota, presided were: Prof. Peter Debye of Berlin, 1936 Nobel prize winner in chemistry, at present George Fisher Baker lecturer at Cornell University, speaking on "Determination of Molecular Structure by Interference Methods"; William H. Bradshaw, Du Pont rayon research director on "Cordura" and Dr. Henry A. Gardner of Washington, D. C., director, scientific section, National Paint, Varnish and Lacquer Association, on "The Drying Oil Situation in America."

Chosen as the year's best young biochemist, Dr. Eric Glendinning Ball, 35 year-old associate at the Johns Hopkins School of Medicine received $1,000 Eli Lilly and Company Award in Biological Chemistry for studies of biological substances including the hormone adrenalin and vitamins B_2 and C.

A complete report on the meeting spotlighting papers of major interest to chemical field will be carried in May CHEMICAL INDUSTRIES.

Hugh A. Galt Retires

Hugh A. Galt, president of Columbia and Southern Alkali, Pittsburgh Plate Glass subsidiaries, has retired after 40 years service. He was also vice-president of parent company.

He will continue as director of the Pittsburgh Plate Glass Company, director of the Cleveland and Pittsburgh Railroad, and director of the First-Central Trust Company of Akron, Ohio.

Mr. Galt has been an industrial and civic leader in northern Ohio for many years. Despite retirement he intends to devote his time to what he calls "unsolved problems in the chemical industry that can and should be solved." As a step in this direction he is considering the establishment of a research laboratory at Akron, Ohio.

HUGH A. GALT

Mr. Galt came to the United States from Scotland at the age of 21 to manufacture bichromate of soda for Harrison Brothers, Philadelphia. After two years, he became superintendent of newly formed Michigan Alkali at Wyandotte. In 1899, interests connected with Pittsburgh Plate Glass called on him to build and operate a soda ash plant which became the Columbia Chemical Corp., later being taken over by Pittsburgh Plate Glass and operated as Columbia Chemical Division.

Mr. Galt is a member of A. C. S., A. S. C. E. and S. C. I. of Great Britain. He is director and vice-president, Citizens' Hospital, Barberton, Ohio, trustee of the Westminster Presbyterian Church of Akron. His clubs are the Portage Country Club of Akron, Seaview Country Club of Absecon, New Jersey, Brookside Country Club of Barberton, Ohio, and the Chemists' Club of New York.

He was born February 13, 1868, in Ayrshire, Scotland, within ten miles of the birthplace of Robert Burns. His public school education was supplemented by a three year course in technical chemistry at Anderson's College, Glasgow, and by special courses in physics at Glasgow University.

First Buna Factory Planned

Arrangements have been completed between the Standard Oil Development Co. and Standard Oil Co. of Louisiana for production of Buna synthetic rubber at Baton Rouge, La. A plant will be erected having capacity of approximately 10,000 lbs. per day.

Several of the large rubber companies have indicated their interest. Firestone Tire and Rubber Co. has obtained license from the Standard to manufacture its own requirements. Another rubber company has indicated it will draw supplies from the Baton Rouge plant.

Story of Manganese

The strategic importance of manganese is dealt with in the leading article in the April issue of *Priorities*, published by Prior Chemical Corporation, New York. The reason for this commodity being placed at the head of the government's list of imported materials essential to national defense is outlined in the article.

Dow's New Sulfur Process

A new process which makes sulfur microscopic fineness available to orchardists for spray purposes has just been announced by The Dow Chemical Company of Midland, Michigan. This recent chemical development produces sulfur with a particle size of approximately 1/5000 of an inch in diameter.

Industrial Advertisers to Meet

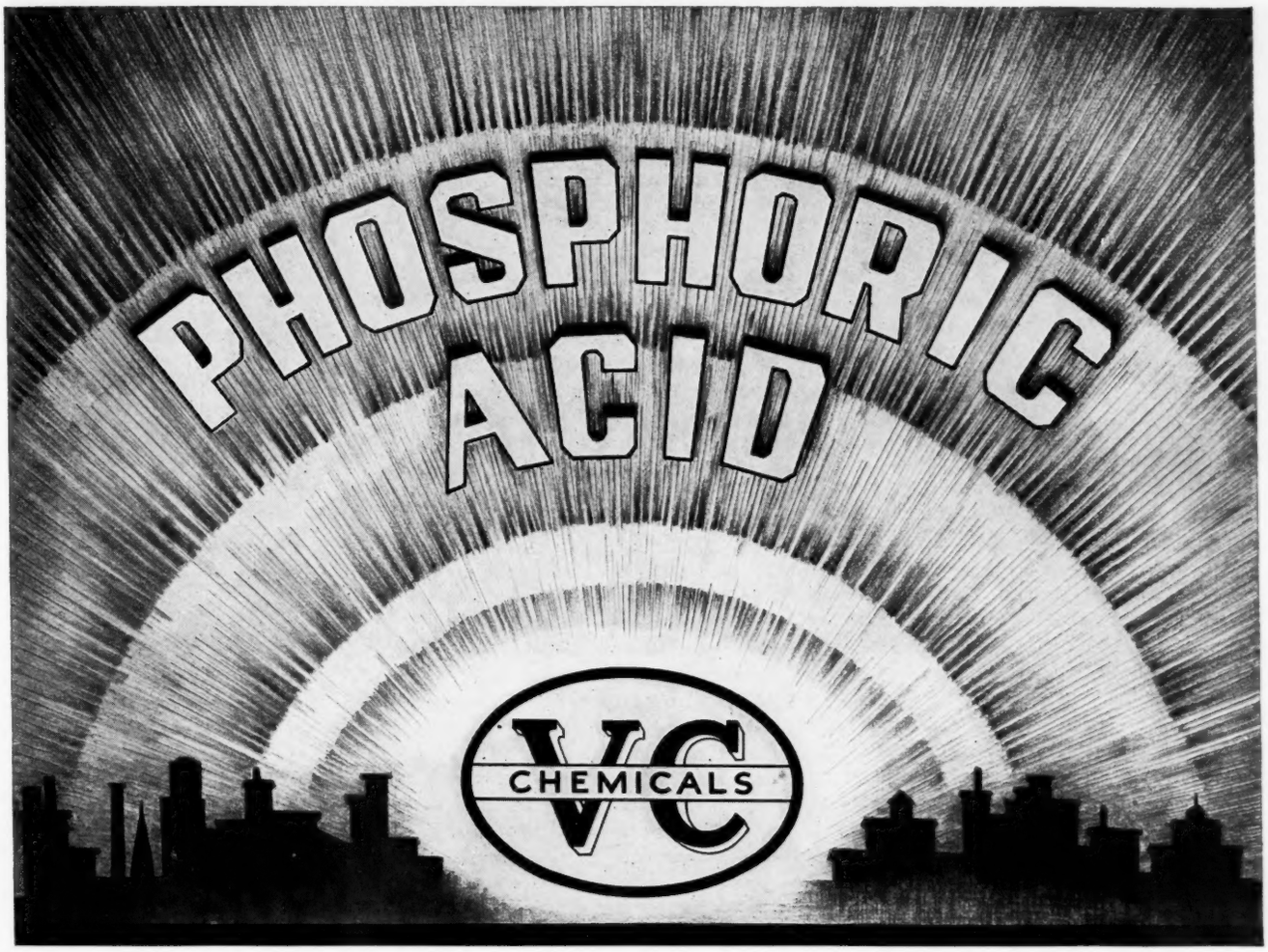
Industrial advertising and marketing executives of U. S. and Canada will meet at Hotel Statler in Detroit, Sept. 18-20 for 18th annual conference of National Advertisers Association.

Du Pont Fellowships

Du Pont has announced awards for postgraduate fellowships and postdoctorate fellowships in organic chemistry to twenty universities. Since beginning of these awards during the academic year '18-'19, approximately $400,000 has been awarded to 450 holders.

New Duraloy Branch

Duraloy Company, Scottdale, Pa., establishes agency known as Duraloy Company of Detroit, 1124 Ford Building, Detroit, to cover State of Michigan. F. B. Cornell and C. H. Knappenberger comprise staff.



Broadening the Role of "PHOSPHORUS MIRABILIS"

IN THE same pioneering spirit with which it mined the first phosphate ores produced in this country . . . V-C is working hand-in-hand with Industry, developing the role of "Phosphorus Mirabilis" in technical, food, drug, and commercial fields—thereby adding impetus to Industry's conquest for broader horizons and greater economies in production. V-C produces all grades of the beneficent *Phosphoric Acid* . . . and our technical staff and development laboratories will gladly assist in determining its adaptability to your processes.

V-C Silage (Phosphoric) Acid affords an effective, economical and easy means of preserving grass silage, an important phase of the growing trend to grassland culture.

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SODIUM PHOSPHATES — SULFURIC ACID —
SPECIAL PHOSPHATES AND COMPOUNDS . . .
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Richmond, Virginia

Washington

Russell Kent

WAR is having its effects upon the American chemical industry; not in orders for chemicals to be used in production of munitions, but in stimulating exports with emphasis upon heavy chemicals and to some extent in stimulating imports with the emphasis here upon raw materials.

The spurt in chemical foreign trade is attributable to dislocations caused by war rather than directly to war demands.

Russell Kent

Statistics of the Department of Commerce show that for the six-months war period, September-February, exports of the chemical group were valued at $127,000,000, which represents a 60 per cent. increase over exports for the corresponding six months of the previous year. Industrial chemicals, naval stores, paint products, were in the forefront of the advance. Exports of industrial chemicals in February were up 160 per cent., in value, as compared with those of the same month of 1939.

The domestic industry, mainly, is adhering to a policy of cash, or its equivalent, before shipment, according to reports in Washington, and is not trying to force foreign sales.

One of the remarkable differences between 1914-15, the outset of the last World War, and 1939-40 is the fact that 25 years ago the United States was so heavily dependent upon foreign nations, especially Germany, for some of its essential chemical supplies while now it is on an export basis. Dyestuffs, in particular, were a cause of great worry to American consumers when German shipments were cut off in 1914. Today, the American industry stands on its own feet. In the September-February period of the new war in Europe, exports of dyestuffs from this country increased from 4,000,000 pounds a year ago to 12,000,000 pounds; with a value increase from $2,000,000 to $5,700,000. The increase is being accentuated, as February figures disclose 2,583,700 pounds of dyestuffs exported this year compared with 752,000 pounds in the same month last year.

On the import side, the chemical list shows a total value of $14,000,000 from September, 1939, through February, 1940, in comparison with $13,000,000 in the same months of 1938 and 1939. Price increases of some products account in part for this increase. There has been a change, also, in that some raw materials formerly processed abroad now are being brought here for processing as well as consumption.

There is some evidence that heavy chemical exports, in several instances, have had difficulty in finding ocean tonnage for shipments to neutrals, even those remote from the main theater of war.

One of the nebulous economic effects of the war in Europe is the result of reduced fertilizer use upon the productivity of German farmlands. By decree, there has been a 40 per cent. reduction. Beyond this, there is the question of supply. The ability of Russia to furnish Germany with phosphate is in question. Certainly, for a period of months Russia has been able to do little or nothing in this regard, for Russian deposits are near the border of Finland and rail transportation facilities were wholly occupied with munitions traffic.

Exports of phosphate rock from the United States have shown a sharp decrease since war started. Germany has been a large purchaser, taking over a third of the hard rock. Germany-destined shipments of land pebble dropped to 272,000 tons in 1939 compared with 358,000 tons in 1938, while hard decreased from 57,000 tons to 55,000 tons. The decrease came after August. The Bureau of Mines reports total phosphate rock exports in 1939 as 949,006 tons, which compares with 1,140,841 tons in 1938.

In connection with its long-drawn inquiry into the fertilizer industry, the Anti-Trust Division of the Department of Justice has announced that "in view of certain commitments made by the two principal domestic sulfur companies, the public interest requires no prosecution by the Anti-Trust Division in the sulfur industry at this time." It is learned also that the Department of Commerce has submitted to the Department of Justice the results of its factual study of the three principal domestic potash producers which it was requested to make in connection with another phase of the fertilizer inquiry.

Congress is making a drive to adjourn so that members may devote attention to political affairs. The best guess possible now is that the session may end around June 15.

When the appropriation bills have been sent to the White House, there appears to be nothing that will be regarded as sufficiently important to hold the legislators in Washington.

As was indicated early in the session, the spirit of economy in appropriations stopped short of pruning sums for relief and for payment of farm benefits. A urban-rural combination demonstrated its strength in the Senate by boosting farm benefits heavily and in the House by increasing funds for the Civilian Conservation Corps and the National Youth Administration.

No tax legislation appears in the picture for the session, although the subject is mentioned now and then, usually in the negative. Nor will this session attempt to increase the debt limit. Both subjects, however, will face the Congress which will be elected in November and begin its work next January.

Queeny Tells Obstacles Retarding Capital Investment

Edgar M. Queeny, Monsanto president, addressing Tennessee Industrial Personnel conference in Memphis enumerated obstacles diminishing flow of venture capital into industry necessary to provide $7,000 investment per employee necessary to create jobs. They were:

1. Federal government registrations of security issues and security exchanges set up such stringent conditions of obtaining capital by the public sale of stock or bonds as to discourage seeking it.

2. Provisions of the Securities and Exchange act requiring that salaries and the purchase and sale of a corporation's securities by its officers and directors be made public, coupled with lack of incentive on account of excessive taxes, caused owners of sound small businesses to refuse to seek public capital for expansion.

3. Increased taxes levied on industry by national, state and local taxing authorities during the period of depression have cut down public returns on new investment.

4. Excessive personal taxation has tended to direct investment away from industry into tax exempt fields, especially government securities.

Answers Questions on Jobs

In answer to the question, "Who or what makes jobs?" Mr. Queeny pointed to three things. "We must mention first the inventor, who works out new and improved processes, machines and prod-

ucts; next, the enterpriser and organizer who finds practical uses for them and brings together the means for putting them into use; and finally the investor who is willing to risk his savings in the creation and development of new enterprises and in the maintenance and improvement of old ones."

EDGAR M. QUEENY

Concluding, Mr. Queeny said: "I hope that soon we will have an administration that will understand and give more than lip-service to the system of private enterprise—an administration that will not regard this nation as a completed one with no frontiers left to conquer—an administration that is not convinced that all the wealth that can be created has been created and that all that is left to do is for government to distribute it equitably. This philosophy accepts the inevitability of present unemployment. This philosophy dooms permanently eight and one-half million of our population who want to work, and who can work, to idleness and a bare existence on relief."

Mathieson Refrigeration Chart

The Mathieson Alkali Works, Inc., have prepared and issued a large blueprint chart for purpose of giving operating engineers and plant managers a convenient guide to, and record of the essential steps in the annual overhauling of ammonia refrigeration equipment. Skillful, thorough maintenance of equipment means maximum refrigeration output, insurance against costly breakdowns, and longer life of equipment. The timely issuance of this chart will, no doubt, be of great help in overhauling refrigeration equipment in preparation for the summer months.

In detail, the chart is a blue-printed flow sheet of a refrigeration system. Each item that should have attention is pointed out on the chart and directions are then listed for the checking and overhauling of that item.

Extra copies of this chart are available upon request.

New Jefferson Lake Name

Jefferson Lake Sulphur Co., Inc., Whitney Building, New Orleans, is new name of former Jefferson Lake Oil Co., Inc.

Buy Waterfalls Paper Mills

Waterfalls Paper Mills, Mechanic Falls, Maine, formerly owned by a European corporation, has been purchased by an American syndicate. K. O. Hohle was reelected president at first meeting of new Board of Directors, with Daniel J. Walsh, Sr., vice president; James G. Crump, treasurer, general manager; Frederick E. Thorpe, assistant treasurer. No change in location or company policy is expected.

Northwest Products Formed

Northwest Products Company organized at Yakima (Wash.) to handle diatomaceous earth in carload lots. L. McAlpin is manager.

Ohio Chemicals Organized

Ohio Chemical & Mfg. Co. incorporates in Delaware to deal in oxygen, nitrogen. Thomas G. Larrison, Jersey City; Augustus J. Thoma, Maspeth, N. Y., and John A. Hill, Mt. Kisco, N. Y., are incorporators.

National Carbon Meeting

National Carbon held sales, advertising, merchandising meeting at Des Moines, Iowa, with 125 jobbers, salesmen, sales managers, in attendance. J. W. Swallen, division sales manager, was in charge.

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The lack of moving parts, maintenance cost and chemical refrigerants, combined with the low operating cost, makes this method the most desirable for batch or continuous process cooling and crystallization, — with or without vacuum contact, corrosive contact or degassification. For intermediate temperatures down to 32° F. this type of refrigeration is unequalled. Croll-Reynolds Company is widely known for the successful designing and fabrication of the necessary equipment.

Vacuum Refrigeration is but one of the many applications of Croll-Reynolds Steam Jet EVACTORS. Condensors, Evaporators, Crystalizers, Deodorizers, Dryers, Stills, Impregnation Equipment and many other miscellaneous vacuum requirements are filled with equal efficiency.

Other Croll-Reynolds products are Feed Water Heaters, Hot Water Heaters, Evaporators, Deaerators, Deaerating Heaters, Heat Exchangers, Air and Gas Coolers, Expansion Joints in Oil Heaters and Coolers.

Croll-Reynolds engineers and facilities are at your disposal for the solution of your particular vacuum and refrigerating problems.

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Personalities in Chemistry

By Adam C. Fadyen

THE inventions of no other chemist in history enter into the daily life of the public in such variety of ways as do those of Carleton Ellis, president of the Ellis-Foster Company, and the Ellis Laboratories, Incorporated, both of Montclair, New Jersey. Averaging better than two inventions each month for over twenty-five years, Mr. Ellis today is recognized as the world's most prolific inventor. Though probably best known for his work in connection with petroleum, paints and varnishes, hydrogenation of oils, and the new urea formaldehyde plastics, Mr. Ellis' 741 patented inventions touch nearly every branch of the chemical arts. Soaps, cosmetics, explosives, fertilizers, floor tiles and waxes, dyes, glass, food products, printing inks and papers are familiar things incorporating improvements worked out by him.

Carleton Ellis

A camera received upon his eleventh birthday as a present from his father switched the boyhood ambition of Carleton Ellis from electricity to chemistry. The wonders of the chemical reactions of photography excited his curiosity and started him upon his brilliant career as a research chemist. Every print he developed included some chemical experiment designed to improve photography. When his thrifty New Hampshire parents protested his endless experiments as wasteful extravagance, the young photographer resorted to exploiting his skill throughout the community as a means for continuing his investigations.

Mr. Ellis' first invention, conceived in his early twenties and while serving as an instructor at the Massachusetts Institute of Technology, was the paint and varnish remover compound, now used the world over. Under an old shed, with a few barrels for equipment, the young inventor began manufacture of his compound, while one of his college classmates acted as salesman. Imagine their embarrassment, when, while operating upon such a scale, the Pennsylvania Railroad requested delivery of a car load of the Ellis paint remover compound. The Pennsylvania Railroad thus sponsored the paint remover industry!

While in the midst of his paint remover business the thought occurred to Ellis that perhaps someone might devise a perfect paint and thereby supplant his paint remover business. Ellis decided to be that man. Having tried all natural oils and resins in his search for a perfect coating Ellis turned to synthesis of resins. Resins in turn led him into the field of plastics, where he pioneered the urea formaldehyde type.

Mr. Ellis has conducted more than 500,000 experiments and synthesized upwards of 100,000 resins. Many of his patented inventions relate to methods of synthesizing the various resins required in paints, including "tung" oil, formerly obtainable only from China.

Though Mr. Ellis has not yet concocted what he considers a perfect paint, his improvements in advancing the coating art toward his goal run into the hundreds. He introduced the lowly rosin into the society of fine paints. He revolutionized automobile painting by making the first durable lacquer of tung oil, soy beans and certain synthetic resins.

For his feats in the field of petroleum, Ellis became known as the "miracle man of Montclair." More than forty billion gallons of gasoline have been produced under his famous "tube and tank process." He taught the world how to obtain isopropyl alcohol from the waste cracking vapors, thereby bringing to the public at less than a dollar a gallon a commodity formerly selling for about five dollars a gram. By converting ordinary paraffin into a substitute for fat he wedded petroleum to the soap industry. During the World War he met Uncle Sam's dire plea for acetone, needed in "dope" for airplane fabrics, making that, too, from petroleum.

Mr. Ellis' pioneer work pertaining to hydrogenation of oils has affected the entire world. In fact, his efforts are recognized as having averted a world famine in fats during and immediately following the period of the last War. This work is the basis for the recent press accounts of German activity in synthesizing butter substitutes from shale oil.

Save for the brief period of manufacturing the paint remover, Mr. Ellis has steadfastly evaded engaging in commercial production in order that he might devote his labors to the work he dearly loves—research. Beginning with two small rooms, his laboratories have expanded to include several buildings, including a branch laboratory in Florida used solely for testing coating materials.

Besides carrying on his own research and serving as consultant to a number of corporations, including the Standard Oil and the Procter & Gamble Companies, Mr. Ellis has found time to contribute to chemical literature eight books and more than forty technical papers. Two of his works alone, "Synthetic Resins and Their Plastics" and "Chemistry of Petroleum Derivatives," in magnitude exceed the combined works of Shakespeare. His recent book "Soilless Growth of Plants" has been the best seller on that fascinating subject.

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USI **SOLVENT NEWS** *Reg. U.S. Pat. Off.* USI

April ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1940

Vitamin B_1 Shows Striking Effects In Plant Culture

Stimulation of Growth, Prevention Of Root Shock are Among Effects

PASADENA, Cal.—That Vitamin B_1 may have beneficial effects on plant life is indicated by tests recently reported here.

Applied in the form of a solution containing as little as 1 part in 100,000,000 parts of water, Vitamin B_1 is reported to have displayed good potentialities in horticulture. Temperamental plants, treated with a vitamin solution, are said to have put forth large blooms, and sickly growths are restored to health. Orchid seeds germinate faster; camellia and gardenia shrubs produce blooms with less tendency to turn brown in corsages; quantity and quality of fruit grown in orchards have been im-

Photomicrograph showing Vitamin B_1 crystals, which may prove a boon to plant culture if results of recent experiments are borne out. (Courtesy of Merck & Co. Inc.)

(*Continued on next page*)

Waterproof Silk with Aid Of Ethyl Acetate, Alcohol

COLUMBUS, Ohio—How a textile fabric, such as silk, can be treated to make it substantially permanently waterproof, while remaining flexible and non-tacky, is revealed in a patent granted to two inventors here.

Process consists, it is claimed, in applying a coating lacquer having a nitrocellulose body, a plasticizer, and a softener. Mica, a pigment, or a cellulose flock is applied upon the lacquer.

A typical formula for the lacquer, according to the patent, has the following proportions:

	Parts by weight
Nitrocellulose	12.5
Maleic acid	17.5
Methyl ricinoleate	15.0
Toluol	5.0
Ethyl acetate	22.5
Alcohol	15.0
Petroleum thinner	12.5

Ethyl Acetate and Alcohol are produced by U.S.I.

Removes Odor From Tung Oil

NEW YORK, N. Y.—The odor of tung fruit can be removed from tung oil by a new process, it is announced by a manufacturer here. Oil so treated may be obtained with either a neutral or with specified odors.

Tests made over a sixty-day period indicate that the deodorized tung oil retains its properties and does not revert to its original odor, it is claimed.

Wide Use Found for Solvents and Chemicals in Rubber Manufacture

Applications of U.S.I. Products Range from Deodorants to Laboratory; Include Both Solvent Uses and Chemical Reactions

Alcohols, esters, ether, acetone, and many other U.S.I. products are consumed in large quantities by the rubber industry for a highly diversified range of applications. In some cases these products are used directly; in others they are employed as chemical reagents.

One of the most recent developments in the rubber industry, which has opened new applications for U.S.I. products, is the increasing use of odorant or perfuming materials, chiefly in rubber goods for household use. Ethyl alcohol and some esters are employed in the manufacture of these materials, which either neutralize the rubber odor, or impart a new and lasting pleasant odor.

Heavy Acetone Consumption

Compounding of anti-oxidants for rubber accounts for a consumption of acetone running well up toward the million-pound figure every year. Practically every rubber manufacturer incorporates about 1% of anti-oxidant in every pound of fabricated rubber, and the anti-oxidant is usually prepared by reacting acetone with aromatic amines.

Another use for acetone—though a relatively small one—is in the determination of "acetone extract" as part of standard analytical procedure.

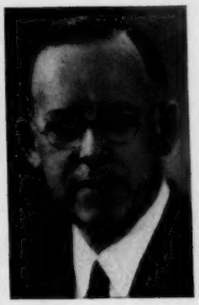
Use of Alcohols

Ethyl, methyl, isopropyl, N-butyl, and amyl alcohols, as well as their esters of acetic, butyric, and phthalic acids, are all extensively used as solvents in the formulations of lacquers for protecting and decorating rubber articles. Another application of ethyl alcohol in the rubber industry is as a solvent for acetic acid in coagulating baths for manufacturing rubber goods from compounded latex. N-butyl alcohol is the source of butyraldehyde, which is reacted with aniline and other aromatic amines to form organic accelerators. A further use is in the manufacture of zinc butyl xanthate, used as an ultra-accelerator. Ethyl ether finds use in mixtures of solvents for lacquers.

(*Continued on next page*)

Dr. H. L. Fisher of U.S.I. Receives Pioneer Award

NEW YORK, N. Y.—Dr. Harry L. Fisher, of U. S. Industrial Chemicals, Inc., was selected as one of the Modern Pioneers recently honored by the National Association of Manufacturers.



Dr. Fisher was chosen for this honor because of his outstanding achievements in the field of rubber chemistry and technology. He holds many patents in this field, the most notable being those covering materials used for adhering rubber to metal, as well as a process for their application, all of which have made possible substantial savings in cost, together with greater safety in handling chemical solutions.

Dr. Fisher is an authority on non-sulphur vulcanization of rubber. He has patented several processes in this field, and delivered a paper on the subject at the Goodyear Centennial Celebration of the American Chemical Society last fall. He is the author of "Laboratory Manual of Organic Chemistry."

Dr. Fisher joined the staff of U.S.I. in 1936, and makes his headquarters at the company's research laboratories in Stamford, Conn.

The solubility of damar, copal, and a number of other natural gums and resins in a wide range of the commonly used industrial solvents is given in convenient tabular form in a data sheet available on request from U.S.I. Ask for Bulletin SG.

The rubber industry is constantly broadening the field of application for its products. Tires, bathing suits, beach toys and cushions, and footwear are a few of the major uses of rubber. U.S.I. solvents and chemicals play an important part in rubber manufacture.

ADVERTISEMENT—*This entire page is a paid advertisement.*

April ★ **SOLVENT NEWS** ★ 1940

Says Heating Helps Blend Nitrocellulose, Rubber

NEW YORK, N. Y.—That nitrocellulose and rubber can be satisfactorily blended in the presence of a drying or non-drying oil if the rubber is first dissolved in the oil by gentle heating is suggested in a recent issue of *American Ink Maker*.

A suggested procedure is given as follows: To 200 grams of linseed stand oil, heated to 110°C., gradually add 100 grams of chlorinated rubber, stirring while adding, and gradually raising the temperature to 135°. The operation is said to require about an hour. A non-drying oil such as castor oil may also be used if the temperature is raised more gradually and the heating continued for a longer time.

It is said that a solution of these oil chlorinated rubber products is miscible with nitrocellulose in common solvents, to form a lacquer that dries to a homogeneous film.

Helpful information on the bulking of nitrocellulose when dissolved in a solvent is contained in a new data sheet. Bulking constants are included for both dry and wet nitrocellulose. Copies of this sheet may be obtained free of charge by writing U.S.I. Ask for Bulletin NB.

Solvents In Rubber

(*Continued from previous page*)

High-boiling esters, such as ethyl lactate, dibutyl oxalate, and the alkyl phthalates, in addition to their use as plasticizers in lacquers, are valuable as softeners in rubber compounds and as foam-preventers in the production of some organic chemicals. Where "delayed action" is necessary, monobutyl phthalate may be employed as a vulcanization retarder.

Ethyl acetoacetate — the basis for Hansa Yellow pigments — is being used in larger quantities by the rubber industry, as these pigments continue to supplant the older and heavier inorganic yellows.

In Organic Synthesis

All of these products are also used in the synthesis of many organic chemicals used in the rubber industry. Other U.S.I. products extensively employed in synthesis are ethyl chlorcarbonate; acetoacetanilid, an intermediate in the manufacture of Hansa Yellows, and also used in the preparation of pyrazolone derivatives; diethyl carbonate, an excellent solvent of unusual stability; ethylene gas; and ethyl sodio-oxalacetate, which is easily converted into the tartrazine dyestuffs.

U.S.I. will be glad to furnish additional information on the applications of its products in the rubber industry.

New Ink Dries Instantly By Cooling to a Solid

NEW YORK, N. Y.—A new ink that is solid at room temperatures, melts at low heat, and solidifies again the instant it touches the paper is the latest development in quick drying, according to a manufacturer here.

Temperature of about 200° F. is sufficient to melt the ink, and the cooling effect of the paper brings about the change back to a solid. No chemical change takes place in the ink in the melting or solidifying, it is claimed. It is said that the faster the paper travels, the faster the ink dries.

Uses Absolute Alcohol In Coloring Aluminum

LONDON, England — Aluminum and its alloys can be colored and given increased corrosion resistance by a process involving the use of pigments in a volatile medium, such as absolute alcohol, it is claimed in a patent issued here.

According to the patent, an oxide coating is first produced on the surface of the aluminum by an anodic treatment. The coloring medium is prepared by dispersing a water-insoluble oil paint in the absolute alcohol, and applied by brush or spray.

It is claimed that this process eliminates the defects which may occur when water-soluble dyestuffs are used.

Absolute Alcohol is produced by U.S.I.

Vitamin B_1 in Plant Culture

(*Continued from previous page*)

proved; plants can be shifted with less danger of root shock. Further studies may be required to show whether these effects can be consistently duplicated in soils in other localities.

Outcome of Long Study

Discovery of the effect of Vitamin B_1 on plants came as the result of a series of studies to determine just what chemical substances help plants to grow. As the outcome of these studies, it was learned that Vitamin B_1 is essential to plant growth.

Some plants, such as peas, corn, and beans, apparently synthesize their own vitamins in large quantities, and it is reported that external applications have no effect on them. Flowers and shrubs, on the other hand, contain Vitamin B_1, but in insufficient quantities, and it is on growths of this kind that vitamin applications have the most beneficial results, it is claimed.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A thermoplastic resin is said to be soluble in many organic solvents to form coatings that can be processed by heat treatment. It is said that the coatings are stable at temperatures over 150° C., and that they are not attacked by caustic alkaline solutions or acids, except concentrated sulphuric and acetic at elevated temperatures. **(No. 320)**

U S I

Another new resin is said to be suitable for products where resin cannot be used because of its tendency to discolor or deteriorate. Possible applications are said to include adhesives, paper sizings, insulating materials, textile finishing compounds, and waterproofing materials. **(No. 321)**

U S I

A continuous indicator is said to be suitable for continuous checking of presence of combustible gases, petroleum vapors, solvent vapors. **(No. 322)**

U S I

A liquid adhesive causes letters or markers of glass, metal, plastics, porcelain, or wood to adhere to any surface with enough structural strength to provide the necessary support, it is claimed. **(No. 323)**

U S I

A thickness gauge is adaptable to measuring nickel coatings on non-magnetic metals; non-magnetic metallic or organic coatings on magnetic metals; and nickel coatings on iron and steel, according to the maker. Adaptation is made merely by changing magnets on a single instrument, it is reported. **(No. 324)**

U S I

A new finish for boxboard containers is said to prevent grease, oil, and moisture from coming through. It is also said that the finish can be wiped clean with a damp cloth. Finish is expected to be useful for packaging oily or greasy products. **(No. 325)**

U S I

North light can be closely simulated by artificial means, it is claimed. Source is a light fixture that is said to be especially useful in engineering and drafting rooms and similar locations. **(No. 326)**

U S I

Die castings can be cleaned by a new process that is said to remove buffing composition, oils and greases. Two compositions are available, one used for soaking, the second in an anodic electric cleaner. **(No. 327)**

U S I

A flatting agent for paints, enamels, and varnishes has advantages over Carnauba wax or metallic soaps, according to the manufacturer. It is claimed that the new material is readily soluble, forming stable, homogeneous solutions. **(No. 328)**

U S I

A new primer for the protection of steel surfaces is said to adhere to damp metal. According to the maker, it dries dust-free in one hour, takes a second coat in 24 hours, is not attacked by petroleum products. **(No. 329)**

U.S.I INDUSTRIAL CHEMICALS, INC.

60 EAST 42ND ST., N. Y. (U.S.I.) BRANCHES IN ALL PRINCIPAL CITIES

A SUBSIDIARY OF U. S. INDUSTRIAL ALCOHOL CO.

ALCOHOLS
Amyl Alcohol
Butyl Alcohol
Fusel Oil—Refined
Methanol

Ethyl Alcohol
Anhydrous
Absolute
C. P. 96%
Pure (190 proof)
Specially Denatured
Completely Denatured
U. S. I. (Denatured Alcohol Anti-freeze)
*Super Pyro Anti-freeze
*Solox Proprietary Solvent

***ANSOLS**
Ansol M
Ansol PR

ESTERS, ACETATES
Acetic Ether
Amyl Acetate
Butyl Acetate
Ethyl Acetate

ESTERS, ETHYL
*Diatol
Diethyl Carbonate
Diethyl Oxalate
Ethyl Chlorocarbonate
Ethyl Formate
Ethyl Lactate

*Registered Trade Mark

ESTERS, PHTHALATES
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate
Dimethyl Phthalate

OTHER ESTERS
Amyl Propionate
Butyl Propionate
Dibutyl Oxalate

INTERMEDIATES
Acetoacetanilid
Acetoacet-o-chloranilid
Acetoacet-o-toluidid
Ethyl Acetoacetate
Sodium Ethyl Oxalacetate

ETHERS
Ethyl Ether
Ethyl Ether Absolute—A.C.S.

OTHER PRODUCTS
Acetone, C.P.
Collodions
*Curbay Binders
*Curbay X (Powder)
Derex
Ethylene
Methyl Acetone
Nitrocellulose Solutions
Potash, Agricultural
*Vacatone
*Curbay B-G

HEAVY CHEMICALS

Business is Well Ahead of Last Year

Expanded Buying Fails to Materialize—General Inventories Seen Still Large Due to Over-Buying in Last Quarter—Few Contract Adjustments—Export Inquiry Fair with Sellers Choosey

EXPECTED expansion in heavy chemical buying failed to materialize last month. General business for first quarter ran well ahead of last year, but that period was in no sense big. Present dullness is, of course, accentuated because it follows on the heels of what can now safely be called the "big false boom."

Slump is generally accredited to jobbers and consumers who "bought for current consumption" during final quarter of '39. Goods bought at that time are still being consumed, it is stated authoritatively, and there is still enough left over as the second quarter begins to keep the market in a lackadaisical state. Buying is strictly from hand to mouth on most items.

Few Contract Adjustments

As was expected there were contract adjustments on relatively few items. A move upward has been reported in T.S.P., by one factor. Alumina sulfate, iron free, was quoted 15c higher, going from $1.45 to $1.60 in bags, and $1.65 to $1.80 in barrels. Material still has a long way to go, however, before it reaches point from which it receded in 1938. Drop at that time was appearance in market of foreign material. Recent boost is caused by the same situation in reverse, i.e. the disappearance of import material.

Silicate of soda was among exceptions to general dull trend. Boxboard trade which has felt steady demand for its own product called for this item steadily. Chromic and formic acid moved well due to lack of export material. Sal ammoniac on the other hand experienced easing off of recent heavy demand. Blackouts abroad brought on the boom for ammoniac by setting off flashlight battery factories at fever pitch to cope with demand. Situation is felt to be relieved now, reflecting in the sal ammoniac market.

Export Inquiries Ease

General export inquiries eased off during period under review. Trade sees some British and German material reaching South America, with Germany's exports probably moving through Italy. Japan and Italy, however, are not considered to be taking care of former customers in the western hemisphere.

All export inquiries are being considered carefully, although some new business is being booked, mostly for Latin America, where business, if taken care of, has a chance of becoming permanent trade. Prices in the market remain firm with producers, and inquiries offering below current quotations must look elsewhere for material. With easing off in domestic situation, allotments for export are becoming more generous, with resultant increase in shipments.

Stabilization in export brokerage business seems responsible for some drop in export demand. During hectic fourth quarter, producers received many inquiries for good tonnage which, when checked, proved duplications, with several houses asking for quotations on same shipment. Now that recently opened brokerage offices have found out who are and who are not their clients, duplicate inquiries are not arriving with the same frequency.

Important Price Changes

	March 31	Feb. 29
ADVANCED		
Acid gallic	$0.90	$0.75
Aluminum sulfate, iron-free, bgs.	1.60	1.45
bbls.	1.80	1.65
Barium nitrate	.09½	.09
Uranium oxide, black	3.05	2.65
yellow	2.00	1.75
DECLINED		
Antimony oxide	$0.15	$0.15¾
Calcium arsenate, l.c.l	.06½	.07
Copper carbonate	.161	.165
Copper chloride	.16	.18
Copper nitrate	.16¼	.17
Lead arsenate, l.c.l.	.09	.09½
Magnesite, calc., dom.	58.00	62.00
Sodium stannate	.30½	.31
Stannous chloride	.44½	.45½
Tin crystals	.36	.37
Tin tetrachloride	.22½	.24
Tin straits	.45⅞	.48

Sees Enterprise Throttled

Earnings of all incorporated businesses are subject to double taxation—first against the corporation, subsequently against stockholders whose income reaches taxable amount, Fred A. Ulmer, Monsanto treasurer declared in message accompanying quarterly dividend check. Remedy for unemployment is expansion of private enterprise, he said, and double taxation is throttling it.

Potassium Permanganate Powder

Carus Chemical Co., La Salle, Illinois, has begun production of potassium permanganate in fine powder. Product is approximately 95 per cent. through a 200 mesh screen. Granulations of potassium permanganate are also available in various mesh separations, differentiated as 20-40, 30-60, etc. The new fine mesh material is known as No. 100-200.

Receive Safety Awards

Chemical companies were well represented among Certificate of Merit winners in New Jersey interplant safety contest conducted by State Department of Labor. Local plants of Du Pont, Calco, Cyanamid, Hercules Powder, Virginia-Carolina Chemical, Chipman Chemical, received awards.

Calco Rewards Suggesters

Calco presented 56 cash awards to 46 employes whose suggestions proved of value to management. Suggestions involved saving time, money, in manufacturing or creating safer working conditions.

Service awards to 175 long time employees of The Dow Chemical Company were made by Dr. Willard H. Dow, president and general manager. Above, Dr. Dow (left) presents 21-jewel, gold Hamilton pocket watches and gold pins set with four small diamonds to Paul Engwis (center) and Thomas Griswold, Jr. (right), for 43 years of unbroken service. Two women also received awards. Miss Minnie Keil (inset), receptionist, was presented with a gold pin with four raised stars, signifying 20 years of service. Miss Julia Reuter, also with Dow 20 years, was not present when the awards were made. The presentation of awards for loyal service has been adopted as a company policy and, hereafter, will be an annual event.

COAL TAR CHEMICALS

General Pickup in Demand Cheers Producers

Paint Varnish Field Calling for Material—Cresylic Now Being Made from Petroleum—Toluol Production Still Behind Demand—Benzol in Good Supply—Exports Continue High

A GENERAL pickup in demand for coal tar chemicals encouraged producers during last ten days of past month. Brighter picture was painted partially by the fact that paint and varnish trade, late in starting, is calling for material in increased quantities. Another impetus was the high production rate in automobile industry, which shows no sign of early slackening.

Newsworthy is the first public announcement by Shell Oil of cresylic acid of petroleum origin. National Association of Insecticide, Disinfectant Manufacturers have already developed a new standard specification to cover products using new material. The new standard specification, however, has not yet been finally adopted by the group.

Toluol continues to lag behind demand. Exporters are still calling for this material in quantity with emphasis on nitration grades. Some are reported to be picking up a drop here and there but most inquiries go begging. Producers still insist that contract obligations require everything available, without much chance of the situation being relieved in the early future.

Export demand accounted for a good share of total business in most items during latter part of month. Benzol was in better demand and excellent supply. In the colorful words of one factor, quantities could be found if "you felt in your back pocket." In other words, spot material was easily accessible.

First Quarter Inactive

Despite a more or less inactive first quarter, business on the whole was better than the same period last year. Feeling is sanguine about the second quarter, with general business upturn expected to account for part of it.

Toward month's end, xylol showed improvement, but nothing new developed on cresylic or creosote. Strong demand has developed for refined naphthalene as household season got underway. Withdrawals were good and demand steady, but not above previous seasonal levels. Pyridin was taken steadily in fair quantities, while intermediates moved sluggishly throughout the period under review.

By-product coke production dropped to 4,016,742 tons, off 15% from January. Coke was made at 84 plants of which 80 made ammonia, 56 benzol. Stocks of by-product coke at both furnace and merchant plants were lowered again, Bureau of Mines reports.

Important Price Changes

	March 31	Feb. 29
ADVANCED		
Naphthalene, crude, imp.	$3.00	$2.90
DECLINED		
Diphenylamine	$0.25	$0.29

Estimated tar oil recovery in February was 49,210,039 gallons. Light oil output was 16,233,102 as against 19,029,882 gallons in January.

Benzol Production Down

February production of benzol was 9,695,000 gallons as compared with 11,424,000 gallons in January, bringing two month production up to 21,119,000. This figure represents an increase over last year when 14,929,000 gallons were produced in the same period.

Coal Tar Color Revision

Chemical manufacturers have petitioned Secretary of Agriculture Wallace for amendment of regulations promulgated under the Federal Food, Drug and Cosmetic Act on coal tar colors used in the food and beverage industries.

The petition, filed by the National Aniline & Chemical Co., the Bates Chemical Co., William J. Strange Co. and the Warner-Jenkinson Manufacturing Co., asks that the food color regulations issued by the Food and Drug Administration be amended so as to exempt liquid, paste or tablet form colors containing not more than 12% pure certified coal tar dyes.

Under regulations established in May, 1939, a batch of certified coal tar color becomes uncertified when placed in a mixture and must be resubmitted to the Food and Drug Administration for certification. This procedure entails a large expense of time and money. In many cases the color is used in only small quantities combined with harmless diluents and resold in the form of liquids, paste or tablets. Nevertheless each mixture must go through the procedure of re-certification.

W. B. Lawson Forms Company

William B. Lawson, formerly with Harshaw Chemical, has organized W. B. Lawson, Inc., dealing in industrial chemicals, oils, and non-ferrous metals. Officers are in Union Commerce Building, Cleveland.

Mr. Lawson joined the Harshaw organization in 1930, resigned Jan. 25, this year. Previous to joining Harshaw he was with International Nickel, holding various executive positions. When he resigned from International in 1930 he was Director of Sales, a position he had held for several years.

Baker Fellowships Open

J. T. Baker Chemical Co. Eastern, Mid-Western Fellowships for research in Analytical Chemistry, are now open for '40-'41. Fellowships offer $1,000 annually to students devoting at least nine months to research in an institution conferring Ph.D. or Sc.D. chemistry degree. Candidates must possess Bachelor's degree or equivalent, plus broad training in fundamental branches of chemistry.

No Monsanto Munitions

Monsanto will produce no munitions "unless required to do so by the government," Edgar M. Queeny, president, declared in annual report to stockholders. Facilities are fully occupied with peacetime products for which company hopes there will be permanent, increasing demand, he said.

Stokes & Smith's attractive display at Packaging Exposition, held last month in N. Y. City, was a mecca for visitors on the exhibition floor.

Personnel

Marlin G. Geiger, resident manager, Westvaco Chlorine plant at South Charleston, W. Va., and Max Y. Seaton, technical research director, were elected Westvaco vice-presidents. . . . Ralph W. Baker named assistant to president, The Flood Company. . . . W. C. Dabney, president, Jones-Dabney, has been made vice-president, Devoe & Raynolds. . . . Chester A. Gage, National Starch vice-president, former manager of mid-western division at Chicago, has been named director of sales with headquarters in New York; Milton J. Heim, central division manager moves to Chicago; Donald D. Pascal, service department head, takes over central division; Philip M. Liner southern New England representative becomes New England division manager. . . . C. A. Hemingway has been named manager, Cleveland office of Wishnick-Tumpeer.

William M. Wright has been named Technical Director, United Lacquer Mfg. Corp., Linden, N. J. ... J. K. Henderson has been named Iowa representative of The Pynol Company. ... Dr. Ralston Russell has joined Westinghouse Research Staff in charge of ceramics research. ... S. B. Applebaum has been elected Director, The Permutit Company. ... Edward J. Charlton was appointed General Manager, Lukenweld, Inc., Coatesville, Pa., with other personnel changes as follows: Robert L. Bunting named Shop Superintendent; George L. Snyder, Chief Engineer; D. Bruce Johnston, Manager of Development and Research; Robert B. Nivison, Chief of Inspection. ... John V. Jirasek has joined Worthington Pump and Machinery Corp. as special representative to petroleum, chemical industries. ... Jessel S. Whyte, president, Macwhyte Co., has been named president, Kenosha Manufacturers' Association. ... Walter F. Marks, manager, Milwaukee sales office, National Lead Co., retired May 1 after forty-five years service. ... Charles W. Knapp has joined the Napko Paint & Varnish Works, Houston, Tex., as partner. ... H. E. Dralle is named manager, chemical, petroleum section, Westinghouse industry engineering department.

Isaac Drogin has joined United Carbon Co. as research director. . . . Thomas F. Doumani has joined research staff Union Oil, Wilmington, Cal. . . . Dr. Frank W. Hurd has been named to Chemical Engineering staff, Armour Institute. . . . Leo Harner has been appointed California Service Engineer for Porcelain Enamel & Mfg. Co. . . . Joe S. Thompson becomes district sales manager, Chicago office, Babcock & Wilcox Tube Co. . . . Charles M. Chapman becomes sales representative, Hays Corporation. . . . D. S. Kerr has been named manager Atlanta office, Allis-Chalmers. . . . Nathaniel McL. Sage has been appointed Director, M.I.T. Division of Industrial Corporation. . . . D. J. Doan has become research metallurgist for Eagle-Picher Lead.

Marketing Conference Scheduled

American Management Association Marketing Conference being held April 24-25 at N. Y. City's Hotel Roosevelt, will hold contest on sales presentations—illustrated kits used by salesmen to show uses of products. Judging board will comprise sales promotion executives, typographical experts, sales managers.

Food Technologists' Meeting

Chicago Association of Food Technologists' meeting featured part played by chemist, biologist, production man, in solving food production problems. Fourth meeting of group emphasized water problems in food processing.

Nicholson Addresses Foremen

Capt. A. A. Nicholson, personnel director, Texas Company, addressed Calco Foremen's Club, Bound Brook (N. J.), on "The Foreman Faces a New Era."

PITTSBURGH CONED HEAD STEEL DRUMS
KEYSTONE CONED HEAD FIBRE DRUMS

—the ultimate for shipping "Hot Pouring" materials that harden when cooled!

These patented coned heads (used for one-fill service) readily allow for ample material shrinkage when contents cool. Heads are easily flattened by merely turning drum over on head—thus assuring shipper of full drum at one filling.

Made in sizes up to 70-gallon capacity with black or galvanized steel heads—coned head drums are constructed of either all steel (24 to 30-gauge inclusive) or fibre shells with steel heads and bottoms. May we quote on *your* requirements?

PITTSBURGH STEEL DRUM CO., PITTSBURGH, PA.

PLANTS AT BUTLER, PA., AND GARWOOD, N. J.

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PLANTS AT PENSACOLA, FLA., BUTLER, PA., AND GARWOOD, N. J.

FINE CHEMICALS

Protracted Winter Keeps Seasonal Items Strong

Buying Termed Normal—Slightly Ahead of Last Year—Wholesalers Still Buying Cautiously—Producers Stocks of Mercury Low—Methanol Price Reduction Affects Formaldehyde.

HIGHLIGHT of fine chemical review for last month was continued strength of seasonal items which passed normal peak without signs of stopping. This feature of market was distinct surprise even to sellers, although an extremely pleasant one considering general dullness of most other items.

Buying was reported as "normal," with a slight improvement over same period last year, but nothing to cause dancing in the streets. Materials could be said to be moving almost directly from producer to consumer, so cautious is wholesale buying. Throughout the final quarter of last year, when the cry "stock up" was heard on every side, wholesalers showed the utmost self-control when placing their orders, one factor reported. And, from every available indication, it hasn't left them.

Prices continued to follow primary markets, with only ascorbic acid showing up in the ground lost columns. This item dropped from $2.75 to $2.50 during the month. But there are a host of mercury and tartar derivatives on the upside to overwhelm this soft spot.

Mercurials Seen Stabilized

Mercurials, as reported in this space last month, scored wide advances. Considering the length of time between the recent sharp upswing in the primary market, and the derivative price rise, the impression might be gained that these items have been peculiarly slow to react on a price basis. Yet when the price chart for six months past is analyzed it reveals that corrosive sublimate went from 82c last September to a current price of $2.04, a rise of $1.22; calomel supported a $1.18 rise from $1.52 to $2.70 during the same period.

Upward movement in mercurials is considered to have reached a top. Prices, however, are volatile. Because of primary market peak, manufacturers are buying with utmost caution. There is no inventory on the metal anywhere. So if the bars come down abroad, it will probably carry the domestic mercurials market with it.

Tartar products were strong, continuing the trend evident for several months past. Another noteworthy event was lopping off part of the surcharges on a number of import chemicals which were added due to war-risk insurance and difference in carrier rates. Formaldehyde and allied chemicals turned soft with the reduction in synthetic methanol. Quotations were lower April 1.

Methanol revisions are as follows:

TANKS

Zone 1	30c	per gallon
Zone 2	32c	" "
Zone 3	34c	" "
Zone 4	34½c	" "

DRUMS
(Car lots)

Zone 1	35½c	per gallon
Zone 2	37½c	" "
Zone 3	39½c	" "
Zone 4	41½c	" "

DRUMS
(l.c.l.)

Zone 1	38c	per gallon
Zone 2	45½c	" "
Zone 3	42c	" "
Zone 4	53½c	" "

Important Price Changes

ADVANCED

	March 31	Feb. 29
Acid tartaric	$0.37¼	$0.35¼
Blue mass	1.57	1.47
powdered	1.60	1.49
Calomel	2.70	2.45
Corrosive sublimate	2.19	2.04
Cream of tartar	.30¾	.28¼
Mercury ointment, 50%	1.94	1.79
30%	1.34	1.24
Mercury bisulfate	2.82	2.62
Mercury iodide, N.F.	4.71	4.56
Red precipitate, N.F.	3.06	2.66
Rochelle salt	.23¾	.22¾
Seidlitz mixture	.18⅝	.17⅝
White precipitate	2.54	2.47

DECLINED

Acid ascorbic	$2.25	$2.75

Genial Albert A. Teeter of Chas. Pfizer is receiving congratulations on completion of twenty-five years' service with company. Anniversary is being celebrated this month.

Methanol Production Declined

Production of synthetic methanol during February 1940 was 3,782,402, as against 2,267,339 gallons in 1939 and 3,452,677 gallons in January 1940. Production of crude methanol totaled 446,815 gallons in February 1940, 336,157 gallons in same period last year and 457,271 gallons in January 1940.

Personals

John Van Nostrand Dorr, president, Dorr Company, and member of CHEMICAL INDUSTRIES Consulting Board of Editors, addressed annual meeting, Rose Polytechnic Institute student chapter, A. I. Ch. E., Terre Haute (Ind.). Speaker discussed experiences during his notable forty-seven year career in chemistry.

Dr. George F. Bowers, of Chicago, development and lubricating engineer for the Standard Oil Company of Indiana, addressed Fort Wayne Chemists' Club at the Wayne Hotel on "Modern Petroleum Refining Processes and Their Significance from a Product Standpoint."

Ernest R. Barrows, Vice President, Sheppard Chemical Co., was honor guest at Founders' Day dinner of Cincinnati Alumni Association, Alpha Tau Omega, Cincinnati.

F. L. LaQue, Development, Research Division, International Nickel, delivered annual lecture before Toronto Chemical Association sponsored by Ontario Research Foundation, on "Corrosion and Corrosion Processes."

W. W. Davies, research engineer, United Air Lines, speaks before Insecticide and Disinfectant convention, Lake Wawasee, Indiana, June 16th, on "Disinfectant Prevention."

Dr. Frederic Joliot and Mme. Irene Joliot-Curie, co-workers in Radium Institute, have been awarded '40 Barnard Gold Medal for Meritorious Service to Science presented every five years by Columbia.

Dr. William A. Mudge discussed manufacture, properties and uses of high nickel alloys before the New Haven Chapter, American Electroplaters' Society, at the Sterling Chemical Laboratory of Yale.

Dr. Campbell Robertson, director of research in colors, R. and H. Chemical, outlined techniques of securing colors in ceramic products recently before 100 members of the Ceramics Club of Rutgers University.

SOLVENTS

Acetone, Ethyl Acetate Contracts Adjusted

Business Trend Upward—No Spot Acetone Available—Sales Still Felt to be Lagging Behind Consumption Due to High Inventories—Germany Exporting to Belgium, Balkans, Scandinavia

BUSINESS is on the upgrade in the solvents field. This fact is reflected in contract adjustments on acetone and ethyl acetate, both of which are quoted fractionally higher in domestic markets. Very little acetone is available for export from first hands, with contracts calling for most of available supply from major factors.

Increase began to be felt during the last two weeks of period under review, and is believed generally to presage a most favorable second quarter. View is held that current brightness is no flash in the pan, but healthy indication of wide business pickup in industries served, which will continue to move on the right side. Fear of price increases due to conditions abroad has abated, relieving pressure on producers for abnormal deliveries.

While frantic calls for material in domestic market has been proved undue pessimism on world conditions, producers are not entirely out of sympathy with consumers. One factor declared that "if they start shooting bullets over there instead of nerves, everything domestic consumers feared will come true." However, no one is anxious for business from this source. Universally, producers have indicated a desire to stay in "their own backyard." The fallacy of building on temporary foundations isn't far enough away to forget.

Butyl Alcohol Strengthens

Butyl alcohol demand strengthened during last month. Shipments maintained a steady pace throughout, reversing the dullness that prevailed during the early months of this quarter.

Sales on the whole are lagging behind consumption, however, because of high inventory situation. Yet, they show some improvement over the dull first quarter of last year. Producers' inventories are reasonable, with shipments prompt once more. It took until January 10 to clear up backlogs built up in December, and until now, before any guarantees could be held out on shipments from an inventory standpoint.

Export inquiry has been high on a number of items, particularly acetone. However, many inquiries are on the undesirable side. Situation is complicated by dealers working on a shoestring basis who shop around for consumer inventories on which they can collect a tiny margin. Naturally material is unavailable in quantity and it would be interesting to see what happened if a sizeable inquiry entered the market from abroad.

Important Price Changes

	March 31	Feb. 29
ADVANCED		
Acetone, tks.	$0.06	$0.05¾
drs., c.l.	.07½	.07¼
Diethyl oxalate	.27	.25
Ethyl acetate, 85-90%, tks.	.07	.06½
drs., c.l.	.08	.07½
95-98%, tks.	.07¼	.06¾
drs., c.l.	.08¼	.07¾
Isopropyl acetate, tks.	.06	.05½
drs., c.l.	.07	.06½
Methylethyl ketone, tks.	.06	.05½
drs., c.l.	.07	.06½
DECLINED		
Methanol, syn., tks.	$0.30	$0.33

Germany As a Supplier

On the other hand, there is a nice inquiry of late from the British Buying Office here. Nice clean business at 4 to 5c above domestic levels.

Foreign demand is relieved somewhat by German re-entrance into supplier's position. Reports are that German material is now getting through to Belgium, Holland, Balkan states, and Scandinavia in sizeable quantities, taking all countries in these blocs out of domestic market.

Petroleum solvents have benefited seasonally. Cleaners' naphtha and Stoddard solvent are moving well to cleaning trade with prices unchanged. Paint makers have come into the market strongly for V. M. & P. naphtha. Rubber solvent, a strong spot since February, keeps moving well to Akron rubber center at 9½c, and lacquer diluent came through with a nice pickup during the period under review.

Ethyl Alcohol Down Slightly

Ethyl alcohol produced during February 1940 amounted to 20,381,272 proof gallons against 14,650,062 gallons for February 1939, and 20,655,547 gallons last month. Alcohol withdrawn for denaturation was 14,696,811 gallons as against 11,198,307 gallons in February 1939. At the end of the month stocks in bonded warehouses were 18,772,537 gallons, contrasted with 24,433,496 in February 1939. Production of completely denatured alcohol was 453,848 gallons as compared with 339,343 gallons in February 1939 and 1,303,991 in January 1940.

Workers Get Vitamin A

Administering of Vitamin A to workers found deficient in substance has cut down rejects due to off-color parts at the Mansfield, Ohio, plant of Westinghouse, the chief inspector, Ralph F. Bisbee, declared. Vitamin A regenerates visual purple, vital to "seeing."

Armour Summer Courses

Armour Summer Graduate Institute in Engineering and Science will sponsor courses in thermodynamics, catalysis, plant design, equipment design, and interpretation of date. Other courses available deal with water treatment processes, chemistry of sewage treatment, advanced sewage treatment plant design.

Roanoke Chemical Chartered

Roanoke Chemical Co., Inc., chartered in Virginia to do chemical, oil, color business. Charles P. Lunsford, Williamson Road, Roanoke, is president.

Donolac Appoints Agent

Donolac Co., Inc., has appointed Cole & DeGraf, San Francisco manufacturers' agent, to handle company plasticizers.

Two distinguished American chemists, Dr. W. L. Semon (right) of the B. F. Goodrich Co., inventor of the versatile coke-limestone-salt compound called Koroseal, and Dr. J. W. Patrick, who found the formula for Thiokol, participated in an unusual synthetic rubber seminar broadcast, sponsored by the Society for the Advancement of Science, in which chemical formulae and properties of the test-tube substances were discussed.

RAW MATERIALS

Report Price Shading on Chinawood

Perilla Quotations Nominal As Material Turns Scarce—Soybean Oil Drops in Price—Varnish Gums Inactive—Copals Price Reduced With Pound Sterling—Jacksonville Naval Stores

MAIN feature of raw materials market was easing of chinawood for first time in months. Trade sources reports were current toward latter part of month that pegged price of the Chinese syndicate could be shaded by ¾c in the East and by more on the Pacific Coast. The late paint season now getting underway, however, probably will remove the shading in a hurry.

Perilla is still quoted nominally. Tightening of chinawood usually develops a sympathetic reflection in this material. Situation was tight going into March and has remained so. Buyers found perilla hard to obtain in quantities desired. No rivers of oiticica appeared, either, but supplies were considered adequate to cope with demand.

Soybean oil which ran up pricewise in February on reports that the soybean crop had been over-estimated, slumped ¼c last month. Rumor proved unfounded as supply poured into market in too great volume to support quotations. Besides, there was talk of greater acreage going into production this season causing situation to become easier, both present and future. A few major processors who withdrew from the oil market last month have come back with revised quotations.

Varnish Gums Inactive

Varnish gums remained inactive through the period under review. Prices were off fractionally due to drop in foreign exchange with which this material is linked. Turn of the month is expected to bring heavy inquiry from paint trade which has already come into the solvents and coaltar markets as reported on those pages. There is felt to be fair inventories in this material which will disappear with the first signs of seasonal activity in the paint trade.

Shellac has felt the effect of protracted bad weather. Sales have been keeping pace with '39 generally regarded as a very good year on this item. Present dullness is expected to be erased shortly, although the inventory situation enters this picture also. Because of war risk many consumers bought heavily on unfounded hunches. No boat carrying shellac or raw material has been lost as yet.

Naval stores went soft after a bullish February. Turpentine and rosin appeared in better supply at Savannah, although receipts continued light. Contract shipments moved well, but buyers maintained a cautious attitude.

Important Price Changes

	March 31	Feb. 29
ADVANCED		
Corn sugar, tanners	$3.19	$3.09
Corn syrup, 42°	3.22	3.12
43°	3.27	3.17
Dextrin, British Gum	3.85	3.75
Corn, Canary	3.60	3.50
white	3.55	3.45
Oil linseed, tks.	.102	.096
Oil palm, Nigir	.045⅝	.043⅜
Starch, corn, pearl	2.70	2.60
powdered	2.80	2.70
Sumac, Italian	140.00	100.00
stainless extract	.09	.07½
Tumeric, powdered	.18	.12
DECLINED		
Albumen, egg, dom.	$0.53	$0.56
Gambier, Singapore cubes	.09	.10
Mangrove bark	31.50	32.50
Myrobalans J1	28.50	30.00
J2	23.50	25.00
Oil babassu	.06⅛	.06⅜
Oil chinawood, drs.	.26½	.27
tks.	.25½	.26
Oil lard, common	.08	.08⅝
Oil menhaden, crude	.34	.35
Oil neatsfoot, 20°	.17½	.19¼
Oil oleo	.07¼	.07¾
Oil olive, denat.	.94	.96
Oil peanut, crude, tks.	.06½	.07
Oil sardine, crude, tks.	.37	.39
Oil soybean, crude, tks.	.06	.06¼
Oil sulfonated castor, 50%	.082	.09
80%	.11	.11¾
Oil Tallow, acidless, tks.	.07½	.08
Shellac, T.N.	.14½	.16½
superfine	.15½	.17½
garnet	.21	.22
Starch, potato	.05	.06¼
Valonia beards	47.00	48.00
cups	35.00	36.00
Wattle bark, E. African	36.50	37.50
S. African	37.75	38.00

Principal news in these items concerned withdrawal of Jacksonville from market. No business will be transacted at that exchange until May 1, members voted. Reason given was wide difference in price between prices there and at Savannah.

Naval Stores Exchange at Savannah now records rosin sales in drums due to recent approval of steel container with cone top for this material. This story will be carried in detail in the May issue of CHEMICAL INDUSTRIES.

Holdings by CCC of rosin and turpentine as of March 21 were released as follows:

	Rosin 1938.	Rosin 1939.	*Turpentine. 1939.
Savannah, bbls.	99,027	50,235	.....
drums	11	2,633	.....
Jack'ville, bbls.	174,082	114,339	1,232,139
drums	.....	11,338	.....
Brunswick, bbls.	92,099	85,524	180,822
drums	190	2,321	.....
Mobile, bbls.	13,308	7,067	.....
drums	761	4,981	.....
Pensacola, bbls.	25,516	17,694	.....
drums	72	3,162	.....
Valdosta, bbls.	120,743	132,706	1,393,355
drums	636	29,686	.....
Wiggins, bbls.	.....	282	.....
drums	.....	6,019	.....
Estill, bbls.	.....	696	.....
drums	.....	6,307	.....
Helena, bbls.	.....	53,509	1,007,166
drums	.....	49,426	.....

* Gallons.

Work Being Rushed On Dow Freeport Plant

Preliminary work is being rushed by Austin Construction engineers preparatory to erection of $5,000,000 plant for Dow at Freeport, Tex. Site purchased for project comprises 800 acres of land, with 3 mile frontage on the harbor.

Plans announced by Willard H. Dow, president, calls for production of 10,000,000 lbs. of magnesium metal annually, with other items to go into production later.

WILLARD H. DOW

Dow is also building a rolling mill at its headquarters plant, Midland. Plant and equipment are estimated to cost around $500,000, and are calculated to increase Midland production of Dow metal by 50 per cent. Building will be one story factory type, 300 feet long, 100 feet wide, with 40 feet height sloping down to 26 feet at the eaves.

Publishes Electric Rates

Federal Power Commission has begun publication of '40 Rate Series showing electric rates as of January 1 in every State. Reports presented form of typical net monthly bills have been issued for Alabama, Delaware, New Hampshire, Virginia. Reports may be obtained from F.P.C. at 10 cents each.

Installs Retirement Program

Innis, Speiden installs retirement program for employees, providing life income after retiring age of 65. Pension, derived from monthly contributions by employer, employees, plus social security benefits, will approximate from 30 to 60 per cent. of pay in majority of cases.

Solvay Builds Addition

Solvay Process Co. is building addition to Hopewell, Va., plant to increase ammonia production capacity by 15 to 18 per cent. Addition will eliminate "bottle neck" condition in continuous process, company declares.

New Plant In Production

Electro Metallurgical Co., Unit of Carbide, put new Sheffield, Ala., ferro-alloy plant into production April 1.

PIGMENTS AND FILLERS

Market Quiet as Spring Buying Lags

Demand for Most Items Sporadic—Lead, Zinc Oxide Demand Better—Titanium Pigments Continue Strong—Carbon Black Price Raised for Second Quarter—Paint Sales Show Drop

FREAK weather keeps pigment men busy checking off future dates on the calendar to show the point where spring paint inquiries will enter the market. The previous report in this space contained a reliable prediction from one factor that upturn was fifteen days away. But trade still is waiting for those fifteen days to pass, although it is thirty days later.

Month did show some improvement, but items previously sluggish showed strength only in fits and starts. Dry colors blew hot and cold with nothing to show that normal seasonal volume had arrived. Demand for lead oxides, white lead, zinc oxides, were slightly better both as to new business and deliveries. Mostly, however, producers are consoling themselves with the thought that outdoor painting season can't stay around the corner very much longer.

Titanium pigments continued strong. March business was well above same period a year ago, and shows improvement over good February month as well. Pace is expected to accelerate still further this month.

Carbon Black Still Strong

Carbon black felt no reaction to the two high volume months preceding period under review. Upper bracket sales figures still furnish a nice picture for producers. Feeling is that some forward buying was present in market anticipating second quarter adjustment in price. Material was quoted 1/5 to ¼c higher than first quarter schedules.

Casein is still the weak sister of the field. Price was off ½c and, at that, quotations were purely nominal. There was talk of sales below 10c in New York which represents shading on even this low quotation.

Bureau of Census recently released February sales figures from sixty manufacturers of plastic paints, calcimines, and cold water paints. Sales ran to $625,121, slightly off from January's $631,792, and $645,569 for February a year ago. This blends nicely with general market picture reported above.

Dollar volume was divided as follows: cold water paints, $396,738; calcimines, $186,354; plastic paints, $42,024. During first two months, plastic paint sales were $76,385; cold water paints, $789,482; calcimines, $391,041.

Important Price Changes

	Mar. 31	Feb. 29
ADVANCED		
Carbon black, reg.	$0.028	$0.0265
Mercury oxide, tech, yellow	2.66	2.26
Mercury oxide, tech, red	2.81	2.41
Red scarlet ink tones	.55	.50
DECLINED		
Casein, 20-30	$0.10	$0.10½
Red toluidine toner	1.05	1.20

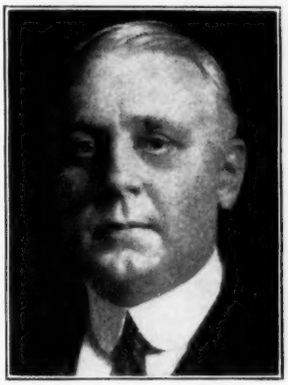
Paint Sales Continue Drop

Combined sales of paint, varnish, lacquer, and fillers have continued to decline since the middle of January. Total sales for February, as reported by 680 manufacturing establishments, were $26,537,573, a decrease of about 7% from January but still an increase of about 4.5% over February, 1939.

Construction Awards at High Level

The *Engineering News Record* reports that February engineering construction awards reached the highest level for any February since 1929, and the second highest on record. The volume for the five weeks of the month, $270,928,000, averages $54,186,000 per week, a 13% increase over the average for the four weeks of January, and 6% higher than the weekly average for the four weeks of February, 1939. The month's private construction awards, on the weekly average basis, are 38% over the previous month and 16% above a year ago. Public construction made minor gains of 2 and 1.5% over last month and last year respectively.

Paint Officials Active



ERNEST T. TRIGG

Ernest T. Trigg, president, National Paint, Varnish & Lacquer Association, was guest of honor at Ad & Sales Club of Toronto, April 9. Day before Dr. H. A. Gardner, Director, Scientific Section of N.P.V.L.A., delivered paper at opening of general session of A.C.S. in Cincinnati.

Flavoring Program Set

Annual Convention of the Flavoring Extract Manufacturers' Association will be held at the Drake Hotel, Chicago, Ill., on June 24-26. Program will again be built largely around the further interpretation of the new Federal Food Drug and Cosmetic Act, somewhat similar to last year's program.

Open Quicksilver Mines

New Almaden Quicksilver Mines near San Jose, Calif., are being re-opened by a Philadelphia syndicate headed by F. Eugene Newbold. Group has leased property for 35 years for $10,000 yearly rental plus 10 per cent. of income.

Greeff Named Agent

R. W. Greeff & Co., appointed sales agents by Pittsburgh Coke & Iron Co., Pittsburgh, for its ammonium chloride, all grades, sodium sulfate. Company recently moved offices from 10 E. 41 Street to 10 Rockefeller Plaza, N. Y. City.

Union Oil Builds

Union Oil Co. of California completes construction of alkylation plant at Wilmington, Cal., refinery. Company also plans erection of cooking unit, hydroformer, and polymerization plant this year.

Leipzig Fair Successful

Leipzig Spring Fair, recently concluded, compared favorably in size with peacetime fairs, sponsor declared. More than 6,600 exhibits from 18 foreign countries were shown in 24 exhibition buildings while buyers from 35 countries attended.

U. S. Testing Merges

United States Testing Co. merges equipment, staff, associates of E. E. Free Laboratories, 175 Fifth Avenue, N. Y. City, with testing company. Laboratories to operate as Engineering, Research Division, at that address.

Givaudan-Delawanna Moves

Givaudan-Delawanna, Inc., moves executive offices, service laboratory, to 330 West 42 Street on May 20. Additional space requirements prompt move, company declares.

Rayon Generic Terms

Generic names for rayon fabric has released first two generic terms describing fabric group; they are "Twalle" and "Grenai."

Sandoz Opens New Office

Sandoz Chemical Works has opened Chicago office at 231 South La Salle Street, with Arthur A. Barker in charge.

AGRICULTURAL CHEMICALS

Return of Cold Weather Kills Southern Business

Late Season Breeds No Pessimism Among Producers—Sulfate of Ammonia in Great Demand for Export—Exports of Other Items Drop—Domestic Crystal Urea Reduced $10 Per Ton

IMPROVED weather conditions brought a nice seasonal inquiry into the agricultural chemical market during the first two weeks of last month. Then, when it seemed that southern farmers were about to take to the soil at last, winter returned bringing snow flurries and plunging the market into the doldrums as the month played out.

Despite the weather, there is no pessimism among producers. "Business isn't bad—just late," was the comment of one factor. Sales thus far have not been comparable to the same period last year, but feeling is that business will equal '39 once it gets going. And '39 bookings of one company were the best in ten years.

Sulfate of ammonia was high spot of market due to high export demand. Calls were so numerous that domestic buyers were reported experiencing difficulty in getting prompt shipments on high volume orders. Both sulfate and nitrate of soda sales reacted to better weather of the first two weeks.

An editorial of interest to fertilizer field entitled "Do Monopolies Quarrel?" will be found on the editorial page.

Export call for sulfate seems isolated in the light of total fertilizer export figures for January recently released. Shipments abroad amounted to 56,602 long tons during January, a drop of 34 per cent. from '39 figures of 85,417 tons. Imports, on the other hand, increased, with 148,382 tons entering this year as compared with 145,918 in January, '39.

New prices on domestic crystal urea were quoted April 1, with material slipping from $95 to $85 per ton. Blood looked for a while at mid-month as though it were firming, but ended with another drop when final figures were in. Tankage also was soft, following trend of past two months.

At the present time, mid-West producers seem inclined to shade prices a trifle to produce business. This policy, however, is not reflected in eastern markets.

Trade has something more to think about than the late season. Down in Winston-Salem, a Federal Court Judge has ruled companies must produce ten year record of operations for scrutiny by Department of Justice prosecutor, who charges industry is a monopoly. An alternative choice provides that if removal of records is not desirable, companies must allow prosecution investigators to scrutinize records as an encore of the F.B.I. probe last year.

Important Price Changes

ADVANCED

	Mar. 31	Feb. 29
None		

DECLINED

Blood, high grade, Chgo.	$3.15	$3.25
Tankage, grd., N. Y.	2.75	3.10
fertilizer, Chgo.	2.85	3.25
Urea, crystal, dom.	85.00	95.00

March Fertilizer Sales Up 4%

March fertilizer sales, as indicated by sale of tax tags, amounted to 1,640,000 tons in the 17 reporting states. This represented gain of 4% over March, 1939, and about same increase over March, 1938. Sales were below March, 1937, but with that exception were the largest for the month since 1930.

Aggregate sales in the South exceeded last year by 4%, the result of increase in seven states and decreases in five. The largest drop was reported by North Carolina, where reduction in tobacco acreage has taken place. The effect of this has not been fully offset by a reported increase in cotton acreage. Largest gains took place in Mississippi, Arkansas, Louisiana, and Texas.

Three of the five Midwestern states reported larger sales in March than a year earlier but these increases were more than offset by declines in Indiana and Illinois. The result was a small recession in total sales in the area.

OBITUARIES

Charles Arthur White, fifty-eight, Secretary-Treasurer, Leeds & Northrup Co., died at Germantown Hospital, after a two-weeks' illness.

Alfred E. Hendey, sixty-seven, President, Hendey Chemical Co., died suddenly at White Plains, N. Y., following a heart attack.

Arthur S. Key, Vice President, Federal Chemical Co., died in Louisville. . . . Lyndon H. Oak, European representative, E. B. Badger & Sons Co., died in London. . . . Thomas C. Mulheron, eighty-four, one of the founders of American Can, died at his home in Newark, N. J. . . . W. S. Josephson, fifty-one, first man to manufacture dry ice, and president of the Dry Ice Corporation of America until 1928, died at his home in Hollis, L. I. . . . Charles L. Rand, fifty-seven, research chemist, secretary, Mitchell-Rand Mfg. Co., died after a long illness. . . . Dr. Leon E. Jenks, sixty-three, retired research chemist, General Chemical Co., died in Utica, N. Y., Hospital.

Henry J. Steuber

Henry J. Steuber, 63, Chemical Engineer, American Dyewood Company, died in a Newark, N. J., hospital. ... Thomas J. Lynch, 68, who retired as General Manager of Lederle Laboratories in 1936, died of a heart ailment. ... Abraham Peters, 62, president, Holland Aniline Dye Co., Holland, Mich., died suddenly when stricken with a heart attack on the street near his office. ... William J. Stange, 69, president, William J. Stange Co., died in Los Angeles. ... R. Spencer Townsend, 57, Trustee of Chemical Lime Company, died at his home at Shawnee-On-Delaware, Pa.

Represents N. Y. Section

Dr. Donald Price, chief research chemist, National Oil Products, represents

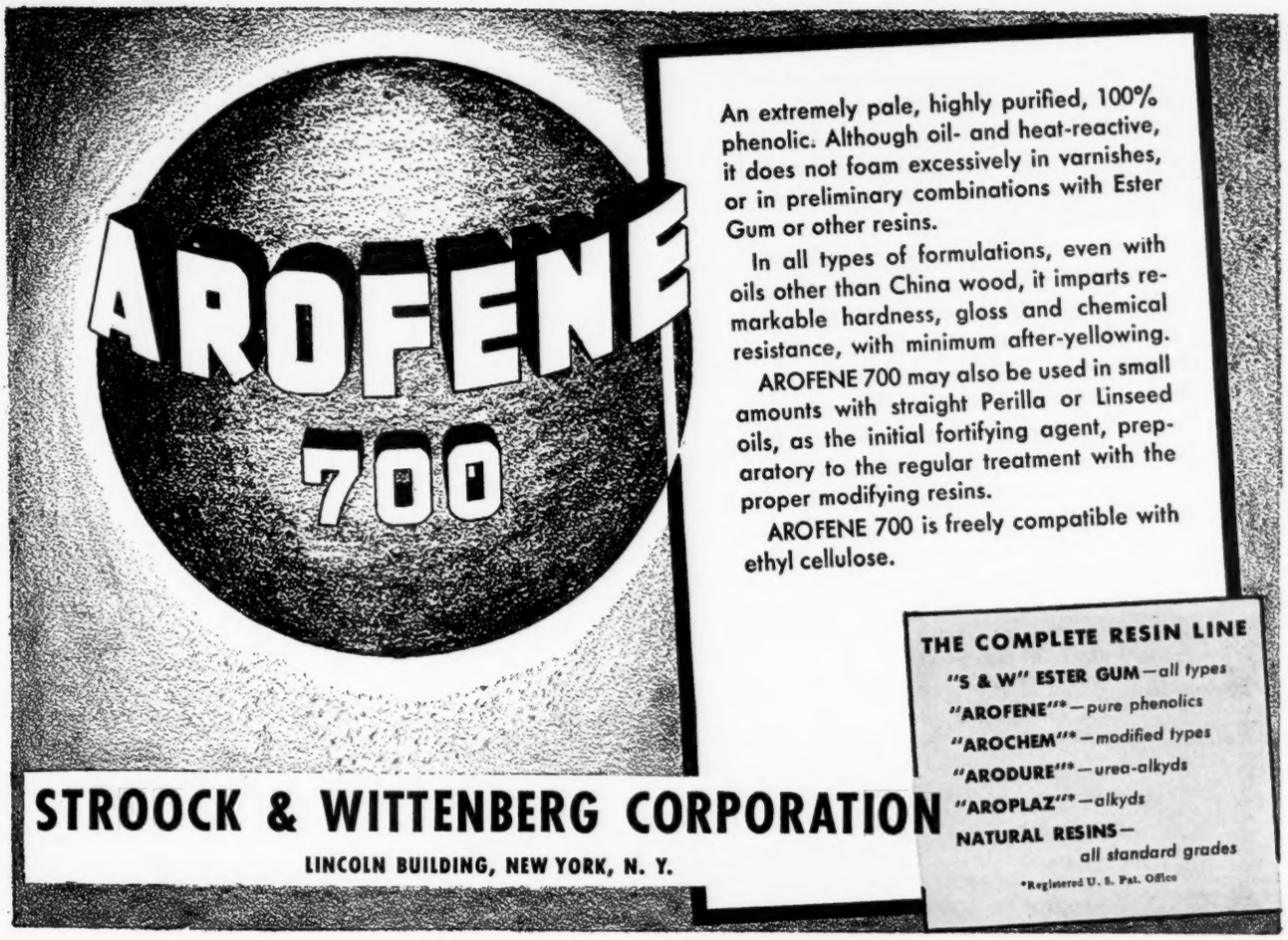
N. Y. Section at A. C. S. Spring meeting in Cincinnati. Dr. Price was elected '40 Councilor for N. Y. Section at meeting held last month.

Dall Heads Phosphate Co.

Maury-Williamson Phosphate Co. recently incorporated, in Tennessee elected Curtis B. Dall, president; Laurence B. Howard, vice president; Frank M. Farris, Jr., treasurer, and Ramsey Clayton, secretary.

Chilean Nitrate Branch

Chilean Nitrate Sales Corporation opened branch office at 317 Commercial Bank Building, Shreveport, La., with Frank R. Curtis as district manager. Office will handle nitrate of soda sale, delivery in Arkansas, Louisiana, Texas and southwestern territory.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An extremely pale, highly purified, 100% phenolic. Although oil- and heat-reactive, it does not foam excessively in varnishes, or in preliminary combinations with Ester Gum or other resins.
In all types of formulations, even with oils other than China wood, it imparts remarkable hardness, gloss and chemical resistance, with minimum after-yellowing.
AROFENE 700 may also be used in small amounts with straight Perilla or Linseed oils, as the initial fortifying agent, preparatory to the regular treatment with the proper modifying resins.
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THE COMPLETE RESIN LINE
"S & W" ESTER GUM—all types
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CRESYLIC ACID—Many distillation ranges appropriate for all established uses—pale color—clean odor—total impurities besides water not exceeding one half of one percent.

TAR ACID OILS—Frozen crystal free at 0°C.—good emulsion-forming properties—low bensophenol content—appropriate for low to high coefficiencies with tar acid contents as required.

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FLOTATION PROCESSES
INSECTICIDES

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1939 Average $1.24 - Jan. 1940 $1.17 - Mar. 1940 $1.18

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Acetaldehyde, drs, c-l, wks lb.	...	.11	...	.11	.10	.14
Acetaldol, 95%, 50 gal drs wks lb.	.21	.25	.21	.25	.21	.25
Acetamide, tech, lcl, kgs lb.	.28	.50	.28	.50	.28	.50
Acetanilid, tech, 150 lb bbls lb.	...	.22	...	.22	.22	.29
Acetic Anhydride, drs, f.o.b. wks, frt all'd ....lb.	.10½	.11½	.10½	.11½	.10½	.11
Acetin, tech, drs .....lb.	...	.33	...	.33	...	.33
Acetone, tks, f.o.b. wks, frt all'd .....lb.	...	.06	.05¾	.06	.04¼	.06
drs, c-l, f.o.b. wks, frt all'd' lb.	...	.07¼	...	.07¼	.05¾	.07¼
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68
ACIDS						
Abietic, kgs, bbls .....lb.	.08¾	.09	.08¾	.09	.08¾	.09
Acetic, 28%, 400 lb bbls, c-l, wks ..... 100 lbs.	...	2.23	...	2.23	...	2.23
glacial, bbls, c-l, wks 100 lbs.	...	7.62	...	7.62	...	7.62
glacial, USP bbls, c-l, wks, ... 100 lbs.	...	10.25	...	10.25	...	10.25
Acetylsalicylic, USP, 225 lb bbls ..... lb.	...	.40	...	.40	.40	.50
Adipic, kgs, bbls ..... lb.	...	.72	...	.72	...	.72
Anthranilic, ref'd, bbls...lb.	1.15	1.20	1.15	1.20	1.15	1.20
tech bbls .....lb.	...	.75	...	.75	...	.75
Ascorbic, bot .....oz.	2.25	2.50	2.25	3.00	2.75	3.25
Battery, cbys, wks ...100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic tech, 100 lb kgs lb.	.43	.47	.43	.47	.43	.47
USP, 100 lb kgs .....lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bgs, delv ..... ton *a*	...	96.00	...	96.00	...	96.00
Broenner's, bbls .....lb.	...	1.11	...	1.11	...	1.11
Butyric, edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs, wks .lb.	...	.22	...	.22	...	.22
wks, lcl .....lb.	...	.23	...	.23	...	.23
tks, wks .....lb.	...	.21	...	.21	...	.21
Camphoric, drs .....lb.	5.50	5.70	5.50	5.70	5.50	5.70
Caproic, normal, drs .....lb.	.35	.40	.35	.40	...	.35
Chicago, bbls .....lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs, wks .....lb.	.03½	.05	.03½	.05	.03½	.05
Chromic, 99¾%, drs, delv lb.	.15¼	.17¼	.15¼	.17¼	.15¼	.17¼
Citric, USP, crys, 230 lb bbls ..... lb. *b*	.20	.21½	.20	.21½	.20	.22½
anhyd, gran bbls .....lb *b*	...	.23	...	.23	.23	.25
Cleve's, 250 lb bbls .....lb.	...	.57	...	.57	...	.57
Cresylic, 99%, straw, HB, drs, wks, frt equal ..gal.	.68	.70	.68	.70	.49	.70
99%, straw, LB, drs, wks, frt equal .....gal.	.68	.75	.68	.75	.55	.75
resin grade, drs, wks, frt equal .....lb.	.08¾	.09¾	.08¾	.09¾	.08¼	.09¾
Crotonic, bbls, delv .....lb.	.21	.50	.21	.50	.21	.50
Formic, tech, 140 lb drs..lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls .....lb.	.24	.28	.24	.75	...	.75
Fuming, see Sulfuric (Oleum)						
Gallic, tech, bbls .....lb.	.90	.93	.75	.93	.70	.73
USP, bbls .....lb.	.92	.95	.92	.95	.77	.81
Gamma, 225 lb bbls, wks..lb.	...	.85	...	.85	...	.85
H, 225 lb bbls, wks .....lb.	...	.45	...	.45	.50	.55
Hydriodic, USP, 47%...lb.	...	2.30	...	2.30	...	2.30
Hydrobromic, 34% conct 155 lb cbys, wks .....lb.	.42	.44	.42	.44	.42	.44
Hydrochloric, see muriatic						
Hydrocyanic, cyl, wks ...lb.	.80	1.00	.80	1.00	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks .....lb.	.06	.06½	.06	.06½	.06	.07½
Hydrofluosilicic, 35%, 400 bbls, wks .....lb.	.09	.09¼	.09	.09½	.09	.09½
Lactic, 22%, dark, 500 lb bbls lb.	.02½	.03¾	.02½	.03¾	.02½	.02¾
22%, light ref'd, bbls..lb.	.03½	.03¾	.03½	.03¾	.03½	.03¾
44%, light, 500 lb bbls..lb.	.05½	.06¾	.05½	.06¾	.05½	.05¾
44%, dark, 500 lb bbls..lb.	.06½	.07¾	.06½	.07¾	.06½	.06¾
50%, water white, 500 lb bbls .....lb.	.10½	.11½	.10½	.11½	.10½	.11½
USP X, 85%, cbys ....lb.	.43	.45	.42	.45	.42	.45
Lauric, drs .....lb.	.14	.14½	.14	.14½	.11¾	.12¼
Laurent's, 250 lb bbls ....lb.	...	.45	.45	.46	.45	.46
Maleic, powd, kgs .....lb.	...	.30	.30	.40	.30	.40
Malic, powd, kgs .....lb.	...	.47	...	.47	.45	.60
Metanillic, 250 lb bbls....lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks .....N unit	.05	.06	.05	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.009
Monochloracetic, tech, bbls lb.	.15	.18	.15	.18	.16	.18
Monosulfonic, bbls .....lb.	...	1.50	1.50	1.60	1.50	1.60
Muriatic, 18°, 120 lb cbys, c-l, wks .....100 lb.	...	1.50	...	1.50	...	1.50
tks, wks .....100 lb.	...	1.05	1.00	1.05	...	1.00
20°, cbys, c-l, wks..100 lb.	...	1.75	...	1.75	...	1.75
tks, wks .....100 lb.	...	1.15	1.10	1.15	...	1.10
22°, c-l, cbys, wks..100 lb.	...	2.25	...	2.25	...	2.25
tks, wks .....100 lb.	...	1.65	1.60	1.65	...	1.60
CP, cbys .....lb.	.06½	.08	.06½	.08	.06½	.07⅛
N & W, 250 lb bbls .....lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs lb.	.14	nom.	.14	nom.	.10	.14
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks .....100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv .....lb.	.11½	.12½	.11½	.12½	11½	.12½
Oxalic, 300 lb bbls, wks, or N Y .....lb.	.10¾	.12	.10¾	.12	.10¾	.12
Phosphoric, 85%, USP, cbys lb.	...	.12	.12	.14	.12	.14
50%, acid, c-l, drs, wks..lb.	...	.12	.06	.12	.06	.08
75%, acid, c-l, drs, wks..lb.	...	.07½	...	.07½	...	.07½
Picramic, 300 lb bbls, wks lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks .....lb.	...	.35	.35	.40	.35	.40
Propionic, 98% wks, drs..lb.	...	.25	...	.25	...	.22
80% .....lb.	...	.20	...	.20	.16	.17½
Pyrogallic, tech, lump, pwd, bbls .....lb.	...	1.20	1.05	1.20	1.45	1.63
cryst, USP .....lb.	1.70	2.25	1.55	2.25	1.55	2.10
Ricinoleic, bbls .....lb.	.27	.33	.27	.33	...	.35
tech, bbls .....lb.	...	.13	...	.13	...	.13
Salicylic, tech, 125 lb bbls, wks .....lb.	...	.33	...	.33	...	.33
USP, bbls .....lb.	.35	.40	.35	.40	.35	.40
Sebacic, tech, drs, wks ..lb.	no prices		no prices		...	...
Succinic, bbls .....lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks lb.	...	.17	.17	.18	.17	.18
Sulfuric, 60°, tks, wks...ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks ....100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks .....ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks ....100 lb.	...	1:50	...	1.50	...	1.50
CP, cbys, wks .....lb.	.06½	.08	.06½	.08	.06½	.07½
Fuming (Oleum) 20% tks, wks .....ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls ..lb.	.54	.56	.44	.56	.40	.47
Tartaric, USP, gran, powd, 300 lb bbls .....lb.	.37½	.37¾	.35¼	.37¾	.27½	.31¼
Tobias, 250 lb bbls .....lb.	.55	.60	.55	.60	.55	.67
Trichloroacetic bottles ....lb.	2.00	2.50	2.00	2.50	2.00	2.50
kgs .....lb.	..	1.75	...	1.75	...	1.75
Tungstic, tech, bbls .....lb.	no prices		no prices		1.70	1.80
Vanadic, drs, wks .....lb.	no prices		no prices		1.10	1.20
Albumen, light flake, 225 lb. bbls .....lb.	.55	.62	.55	.62	.52	.68
dark, bbls .....lb.	.13	.18	.13	.18	.13	.18
egg, edible .....lb.	.53	.59	.53	.62	.58	.78
ALCOHOLS						
Alcohol, Amyl (from Pentane) tks, delv .....lb.	...	.101	...	.101	...	.101
c-l, drs, delv .....lb.	...	.111	...	.111	...	.111
lcl, drs, delv .....lb.	...	.121	...	.121	...	.121
Amyl, secondary, tks, delv lb.	...	.08½	...	.08½	...	.08½
drs, c-l., delv E of Rockies .....lb.	...	.09½	...	09½	...	.09½
Benzyl, cans .....lb.	...	.68	.68	1.00	.68	1.00
Butyl, normal, tks, f.o.b. wks, frt all'd .....lb. *d*	...	.09	...	.09	.07	.09
c-l, drs, f.o.b. wks, frt all'd .....lb. *d*	...	.10	...	.10	.08	.10
Butyl, secondary, tks, delv ..... lb. *d*	...	.06½	...	.06½	.05½	.06½
c-l, drs, delv .....lb. *d*	...	.07½	...	.07½	.06½	.07½
Capryl, drs, tech, wks...lb.	...	.85	...	.85	...	.85
Cinnamic, bottles .....lb.	2.00	2.50	2.00	2.50	2.00	2.50
Denatured, CD, 14, c-l drs, wks .....gal. *e*	.31½	.36½	.31½	.36½	.27½	.36½
tks, East, wks .....gal.	...	.25½	...	.25½	.21½	.25½
Western schedule, c-l, drs, wks .....gal. *e*	...	.34½	...	.34½	.34½	.37
c-l, drs, wks .....gal. *e*	...	.21½	...	.21½	.19½	.22
Denatured, SD, No. 1, tks,	...	.22½	...	.22½	.25½	28½

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.; *y* Price given is per gal.

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

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Sal Soda

Monohydrate of Soda

Standard Quality

		Current Market	1940 Low	1940 High	1939 Low	1939 High
Alcohols (continued):						
Diacetone, pure, c-l, drs, delv	lb. *f*	...	.12	...	.12	.09	.12
tech, contract, drs, c-l, delv	lb.	...	.11½	...	.11½	.08½	.11½
Ethyl, 190 proof, molasses, tks	gal. *g*	...	4.48	...	4.48	4.46	4.48½
c-l, drs	gal. *g*	...	4.54	...	4.54	4.49	4.54½
c-l, bbls	gal. *g*	...	4.55	...	4.55	4.53	4.55½
Furfuryl, tech, 500 lb drs	lb.	...	.35	.25	.35	.25	.35
Hexyl, secondary tks, delv	lb.	...	.12	...	.12	...	.12
c-l, drs, delv	lb.	...	.13	...	.13	...	.13
Normal, drs, wks	lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks	lb.	...	.32	...	.32	...	.32
drs, lcl, delv	lb.	...	.27	...	.27	...	.27
Isobutyl, ref'd, lcl, drs	lb.	...	.073	...	.073	.073	.09
c-l, drs	lb.	...	.069	...	.069	.068	.08½
tks	lb.	...	.059	...	.059	...	.07½
Isopropyl, refd, 91%, c-l, drs, f.o.b. wks, frt all'd	lb.	...	.65	...	.65	...	.36
Ref'd 98%, drs, f.o.b. wks, frt all'd	gal.	...	.65	...	.65	...	.41
Tech 91% drs, above terms	gal.	...	.33½	...	.33½	...	.33½
tks, same terms	gal.	...	.28½	...	.28½	...	.28½
Tech 98%, drs, above terms	gal.	...	.36	.36	.37½	...	.37½
tks, above terms	gal.	...	.31	.31	.32½	...	.32½
Spec. Solvent, tks, wks	gal.	...	.23½	...	.23½	.19	.23½
Aldehyde ammonia, 100 gal drs	lb.	.80	.82	.80	.82	.80	.82
Aldehyde Bisulfite, bbls, delv	lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal. drs, delv	lb.	.11	.12	.11	.12	.11	.20
Alphanaphthol, crude, 300 lb bbls	lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls	lb.	...	.32	.32	.34	.32	.34
Alum, ammonia, lump, c-l, bbls, wks	100 lb.	...	3.75	...	3.75	3.40	3.75
delv NY, Phila	100 lb.	...	3.75	...	3.75	3.40	3.75
Granular, c-l, bbls wks	100 lb.	...	3.50	...	3.50	3.15	3.50
Powd, c-l, bbls, wks	100 lb.	...	3.90	...	3.90	3.55	3.90
Chrome, bbls	100 lb.	6.50	6.75	6.50	6.75	6.50	6.75
Potash, lump, c-l, bbls, wks	100 lbs.	...	4.00	...	4.00	3.65	4.00
Granular, c-l, bbls, wks	100 lb.	...	3.75	...	3.75	3.40	3.75
Powd, c-l, bbls, wks	100 lb.	...	4.15	...	4.15	3.80	4.15
Soda, bbls, wks	100 lb.	...	3.25	...	3.25	...	3.25
Aluminum metal, c-l, NY	100 lb.	...	19.00	19.00	20.00	...	20.00
Acetate, 20%, bbls	lb.	.07½	.09	.07½	.09	.07½	.09
Basic powd, bbls, delv	lb.	.40	.50	.40	.50	.40	.50
Chloride anhyd, 99% wks	lb.	.08	.12	.08	.12	.06	.12
93%, wks	lb.	.05	.08	.05	.08	.05	.08
Crystals, c-l, drs, wks	lb.	.06	.06½	.06	.06½	.06	.06¼
Solution, drs, wks	lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv	lb.	...	.13	...	.13	...	.13
Hydrate, 96%, light, 90 lb bbls, delv	lb.	.12½	.13½	.12½	.13½	.11½	.13
heavy, bbls, wks	lb.	.029	.03½	.029	.03½	.029	.03½
Oleate, drs	lb.	.17½	.20	.16¾	.20	.16¾	.18½
Palmitate, bbls	lb.	.20½	.21½	.20½	.24½	.23	.24½
Resinate, pp., bbls	lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls	lb.	.19	.20	.19	.20	.16	.22½
Sulfate, com, c-l, bgs, wks	100 lb.	...	1.15	...	1.15	...	1.15
c-l, bbls, wks	100 lb.	...	1.35	...	1.35	...	1.35
Sulfate, iron-free, c-l, bags, wks	100 lb.	...	1.60	1.60	1.80	...	1.45
c-l, bbls, wks	100 lb.	...	1.80	1.65	1.80	...	1.65
Aminoazobenzene, 110 lb kgs	lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd fert com, tks	lb.	.04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl	lb.	...	.16	...	.16	...	.16
50 lb cyl	lb.	...	.22	...	.22	...	.22
26°, 800 lb drs, delv	lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH	cont.	...	.04z	...	.04z	...	.04z
Ammonium Acetate, kgs	lb.	.27	.33	.27	.33	.26	.33
Bicarbonate, bbls, f.o.b. wks	100 lb.	...	5.56	...	5.56	5.15	5.71
Bifluoride, 300 lb bbls	lb.	.14½	.16½	.14½	.16½	.14½	.16½
Carbonate, tech, 500 lb bbls	lb.	.08	.11	.08	.11	.08	.12
Chloride, White, 100 lb bbls, wks	100 lb.	4.45	...	4.45	4.90	4.45	4.90
Gray, 250 lb. bbls, wks	100 lb.	5.50	5.75	5.50	6.25	5.50	6.25
Lump, 500 lb cks spot	lb.	.10½	.11	.10½	.11	.10½	.11
Lactate, 500 lb bbls	lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls	lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls	lb.	...	.12	...	.12	.11	.15
Naphthenate, bbls	lb	...	.17	...	.17	...	.17
Nitrate, tech, bbls	lb.	...	.0455	...	.0455	.036	.0455
Oleate, drs	lb.	...	.14	...	.14	.11	.14
Oxalate, neut, cryst, powd, bbls	lb.	.19	.20	.19	.20	.19	.20
Perchlorate, kgs	lb.	.17	.19	.17	.19	...	.16
Persulfate, 112 lb kgs	lb.	.21	.22	.21	.22	.21	.24
Phosphate, diabasic tech, powd, 325 lb bbls	lb.	.07½	.10	.07½	.10	.07½	.10
Ricinoleate, bbls	lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls	lb.	...	.24½	...	.24½	.22	.24½
Paste, bbls	lb.	...	.06½	...	.06½	.06½	.08

g Grain alcohol 25c a gal. higher in each case. ** On a delv. basis.
z On a f.o.b. wks. basis.

		Current Market	1940 Low	1940 High	1939 Low	1939 High
Ammonium (continued):						
Sulfate, dom, f.o.b., bulk	ton	...	28.00	...	28.00	27.00	28.00
Sulfocyanide, pure, kgs	lb.	...	.65	...	.65	.55	.65
Amyl Acetate (from pentane) tks, delv	lb.	...	.095	...	.095	.095	.10
c-l, drs, delv	lb.	...	.105	...	.105	.105	.11
lcl, drs, delv	lb.	...	.115	...	.115	.115	.112
tech drs, delv	lb.	...	.12½	...	.12½	.10½	.12½
Secondary, tks, delv	lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv	lb.	...	.09½	...	.09½	...	.09½
tks, delv	lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks	lb.	.56	.68	.56	.68	.56	.68
mixed, drs, wks	lb.	.0565	.0665	.0565	.0665	.0565	.077
tks, wks	lb.	...	.0465	...	.0465	.0465	.06
Mercaptan, drs, wks	lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs	lb.	...	.25	...	.25	...	.25
Stearate, lcl, wks, drs	lb.	...	.26	...	.26	...	.26
Amylene, drs, wks	lb.	.102	.11	.102	.11	.102	.11
tks, wks	lb.	...	.09	...	.09	...	.09
Aniline Oil, 960 lb drs and tks	lb.	...	.14½	...	.14½	.14½	.17½
Annatto fine	lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80%	lb.	...	.55	...	.55	.55	.75
Anthraquinone, sublimed, 125 lb bbls	lb.	...	.65	...	.65	...	.65
Antimony metal slabs, ton lots	lb.	...	.14	...	.14	.11¼	.14
Butter of, see Chloride.							
Chloride, soln, cbys	lb.	...	.17	...	.17	...	.17
Needle, powd, bbls	lb.	...	.18	...	.18	.12	.20
Oxide, 500 lb bbls	lb.	...	.15¾	...	.15¾	.10	.15¾
Salt, 63% to 65%, tins	lb.	.42	nom.	.42	nom.	.25¾	.42
Archil, conc, 600 lb bbls	lb.	no prices		no prices		.21	.27
Double, 600 lb bbls	lb.	no prices		no prices		.18	.20
Aroclors, wks	lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls	lb.	.09	.09½	.09	.10	.08½	.09
Arsenic, Metal	lb.	...	...	...	...	.40	.60
Red, 224 lb cs kgs	lb.	.17½	.18	.17½	.18	.18	.19
White, 112 lb kgs	lb.	.03	.03¾	.03	.03¾	.03	.03¼
B							
Barium Carbonate precip, 200 lb bgs, wks	ton	52.50	62.50	52.50	62.50	52.50	62.50
Nat (witherite) 90% gr, c-l, wks, bgs	ton	45.00	47.00	45.00	47.00	41.00	47.00
Chlorate, 112 lb kgs, NY	lb.	.20	.22	.20	.22	.16½	.25
Chloride, 600 lb bbls, delv, zone 1	ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs	lb.	...	.10	.10	.12	.11	.12
Hydrate, 500 lb bbls	lb.	.06½	.07	.06½	.07	.04½	.05½
Nitrate, bbls	lb.	.09½	.10½	.09½	.10½	.06¾	.10½
Barytes, floated, 350 lb bbls c-l, wks	ton	...	25.15	...	25.15	...	23.65
Bauxite, bulk, mines	ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks	ton	...	16.00	...	16.00	...	16.00
200 mesh	ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks	lb.	.55	.60	.55	.60	.60	.62
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd	gal.	...	.16	...	.16	...	.16
90% c-l, drs	gal.	...	.21	...	.21	...	.21
Ind pure, tks, frt all'd	gal.	...	.16	...	.16	...	.16
Benzidine Base, dry, 250 lb bbls	lb.	...	.70	...	.70	.70	.72
Benzoyl Chloride, 500 lb drs	lb.	.23	.28	.23	.28	.40	.45
Benzyl Chloride, 95-97% rfd, drs	lb.	.19	.21	.19	.21	.30	.40
Beta-Naphthol, 250 lb bbls, wks	lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls	lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls	lb.	.51	.52	.51	.52	.51	.52
Bismuth metal	lb.	...	1.25	...	1.25	1.05	1.25
Chloride, boxes	lb.	3.20	3.25	3.20	3.25	3.20	3.25
Hydroxide, boxes	lb.	3.35	3.40	3.35	3.40	3.15	3.40
Oxychloride, boxes	lb.		3.10		3.10	2.95	3.10
Subbenzoate, boxes	lb.	3.25	3.30	3.25	3.30	3.25	3.30
Subcarbonate, kgs	lb.	1.73	1.76	1.73	1.76	1.43	1.76
Trioxide, powd, boxes	lb.	...	3.57	...	3.57	...	3.57
Subnitrate, fibre, drs	lb.	1.48	1.51	1.48	1.51	1.23	1.51
Blanc Fixe, 400 lb bbls, wks	ton *h*	35.00	42.50	50.00	80.00	40.00	80.00
Beaching Powder, 800 lb drs, c-l, wks, contract 100 lb.		...	2.00	...	2.00	...	2.00
lcl, drs, wks	lb.	2.25	3.35	2.25	3.35	2.25	3.60
Blood, dried, f.o.b., NY	unit	...	3.10	3.10	3.35	2.50	4.25
Chicago, high grade	unit	...	3.15	3.15	3.50	2.30	4.25
Imported shipt	unit	...	3.20	3.20	3.30	2.65	3.90
Blues, Bronze Chinese Prussian Soluble	lb.	.36	.37	.33	.37	.33	.37
Milori, bbls	lb.	.33	.34	.33	.34	.33	.37
Ultramarine,* dry, wks, bbls	lb.	...	.11	...	.11	...	.11
Regular grade, group 1	lb.	...	.16	...	.16	...	.16
Special, group 1	lb.	...	.19	...	.19	...	.19
Pulp, No. 1	lb.	.22	.27	.22	.27	...	.27
Bone, 4½ + 50% raw, Chicago	ton	32.00	33.00	32.00	33.00	27.00	35.00
Bone Ash, 100 lb kgs	lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50%, imp	ton	...	32.00	...	32.00	22.00	32.00
Domestic, bgs, Chicago	ton	...	32.00	...	32.00	24.00	32.00
Borax, tech, gran, 80 ton lots, sacks, delv	ton *i*	...	43.00	...	43.00	...	43.00
bbls, delv	ton *i*	...	53.00	...	53.00	...	53.00

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; *Freight is equalized in each case with nearest producing point.

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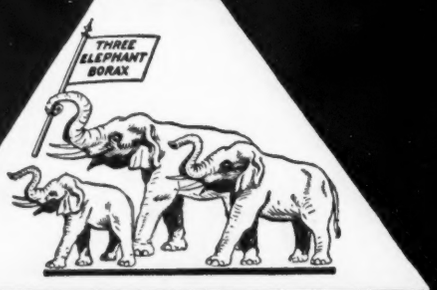

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		Current Market	1940 Low	1940 High	1939 Low	1939 High
Borax (continued)						
Tech, powd, 80 ton lots, sacks	ton *i*	...	48.00	47.00	48.00	...	47.00
bbs, delv	ton *i*	...	58.00	57.00	58.00	...	57.00
Bordeaux Mixture, drs	lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases	lb.	.30	.35	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs	lb.	...	.57	...	.57	.90½	.92½
Gold, blk	lb.	.60	.65	.60	.65	.45	.65
Butanes, com 16-32° group 3 tks	lb.	.02½	.03	.02¼	.03¾	.02¼	.03¾
Butyl, Acetate, norm drs, frt all'd	lb.	...	.10	...	.10	.09	.10
tks, frt all'd	lb.	...	.09	...	.09	.08	.09
Secondary, tks, frt all'd	lb.	...	.06½	...	.06½	.05½	.06½
drs, frt all'd	lb.	.07½	.08	.07½	.08	.068	.08
Aldehyde, 50 gal drs, wks	lb.	.15½	.17½	.15½	.17½	.15½	.17½
Carbinol, norm drs, wks	lb.	.60	.75	.60	.75	.60	.75
Crotonate, norm, 55 and 110 gal drs, delv	lb.	...	.35	...	.35	.35	.75
Lactate	lb.	.23½	.24½	.23½	.24½	.22½	.24½
Oleate, drs, frt all'd	lb.	...	.25	...	.25	...	.25
Propionate, drs	lb.	.16½	.17	.16½	.17	.16½	.18½
tks, delv	lb.	...	.15½	...	.15½	.15½	.17
Stearate, 50 gal drs	lb.	...	.28½	...	.28½	.26½	.28½
Tartrate, drs	lb.	.55	.60	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks	lb.	...	.35½	...	.35½	...	.35½
C							
Cadmium Metal	lb.	.80	.85	.80	.85	.50	.85
Sulfide, orange, boxes	lb.	.75	.85	.75	.85	.75	.90
Calcium, Acetate, 150 lb bgs c-l, delv	100 lb.	...	1.90	...	1.90	1.65	1.90
Arsenate, c-l, E of Rockies, dealers, drs	lb.	...	.06	.06	.07¼	.06¾	.07¼
Carbide, drs	lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l	lb.	...	1.00	...	1.00	...	1.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv	ton	...	22.00	...	22.00	...	22.00
paper bags, c-l, delv	ton	23.00	36.00	23.00	36.00	23.00	36.00
Solid, 650 lb drs, c-l, delv	ton	...	20.00	...	20.00	...	20.00
Ferrocyanide, 350 lb bbls wks	lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls	lb.	.50	.57	.50	.57	.50	.57
Levulinate, less than 25 bbl lots, wks	lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bags	ton	...	29.00	28.00	29.00	...	28.00
Palmitate, bbls	lb.	.22	.24	.22	.24	.22	.23
Phosphate, tribasic, tech, 450 lb bbls	lb.	.0635	.0705	.0635	.07½	.06½	.07½
Resinate, precip, bbls	lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls	lb.	.20½	.22½	.20½	.22½	.19	.21
Camphor, slabs	lb.	.83	.84	.83	.84	.46	.77
Powder	lb.	.83	.84	.83	.84	.45	.47
Carbon Bisulfide, 500 lb drs	lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, delv, price varying with zone†	lb.	.028	...	.02¾	.03¾	.02¾	.03¾
lcl, bgs, f.o.b.whse	lb.	...	.06¼	...	.06¼	...	.06¼
cartons, f.o.b. whse	lb.	...	.06¼	...	.06¼	...	.06¼
cases, f.o.b. whse	lb.	...	.07	...	.07	...	.07
Decolorizing, drs, c-l	lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq 20-25 lb cyl	lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 55 or 110 gal drs, c-l, delv	lb.	.05	.05½	.05	.05½	.05	.05½
Casein, Standard, Dom, grd	lb.	.10	.11	.10	.14	.07	.23
80-100 mesh, c-l bgs	lb.	.11	.11½	.11	.14½	.07½	.23½
Castor Pomace, 5½ NH_3, c-l, bgs, wks	ton	...	17.50	...	17.50	16.50	18.50
Imported, ship, bgs	ton	...	20.00	...	20.00	18.00	20.00
Celluloid, Scraps, ivory cs	lb.	.12	.15	.12	.15	.12	.15
Transparent, cs	lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, 50 lb kgs	lb.	...	.33	.33	.34	.35	.36
Chalk, dropped, 175 lb bbls	lb.	.02¾	.03¾	.02¾	.03¾	.02¾	.03¾
Precip, heavy, 560 lb cks	lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Light, 250 lb cks	lb.	.03¼	.04	.03¼	.04	.03¼	.04
Charcoal, Hardwood, lump, blk, wks	bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv*	ton	25.00	36.00	25.00	36.00	23.00	36.00
Willow, powd, 100 lb bbls, wks	lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified, tks, wks	lb.	...	.01¾	...	.01¾	...	.01¾
25%, bbls, wks	lb.	...	.02½	...	.02½	...	.02
China Clay, c-l, blk mines	ton	...	9.50	7.60	9.50	7.00	7.60
Imported, lump, blk	ton	26.00	nom.	...	26.00	22.00	26.00
Chlorine, cyls, lcl, wks, contract	lb.	.07½	.08½	.07½	.08½	.07½	.08½
cyls, c-l, contract	lb *j*	...	.05¼	...	.05¼	.05¼	.05½
Liq, tk, wks, contract	100 lb.	...	1.75	...	1.75	1.75	2.00
Multi, c-l, cyls, wks, cont	lb.	...	1.90	...	1.90	1.90	2.15
Chloroacetophenone, tins, wks	lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb drs, lcl, wks	lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs	lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins	lb.	.30	.31	.30	.31	.30	.31
Chloropicrin, comml cyls	lb.	...	.80	...	.80	...	.80
Chrome, Green, CP	lb.	.21	.25	.21	.25	.21	.25
Yellow	lb.	.13½	.14½	.13½	.14½	.13½	.15½
Chromium Acetate, 8% Chrome, bbls	lb.	...	.05¾	...	.05¾	.05	.08
Fluoride, powd, 400 lb bbl	lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls	bbl.	7.50	8.00	7.50	8.00	7.50	8.00
Cobalt Acetate, bbls	lb.	...	.71	...	.71	.65	.71
Carbonate tech, bbls	lb.	1.38	1.60	1.38	1.60	1.25	1.63
Hydrate, bbls	lb.	...	1.78	...	1.78	...	1.78
Linoleate, solid, bbls	lb.	...	.33	...	.33	...	.33
paste, 6%, drs	lb.	...	.31	...	.31	...	.31
Oxide, black, bgs	lb.	...	1.84	...	1.84	1.67	1.84
Resinate, fused, bbls	lb.	...	.13½	...	.13½	...	.13½
Precipitated, bbls	lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs	lb.	.37	.38	.37	.38	.35	.38
Teneriffe silver, bgs	lb.	.38	.39	.38	.39	.36	.39
Copper, metal, electrol 100	lb.	11.15	11.25	11.15	11.62½	.10	12.50
Acetate, normal, bbls, wks	lb.	.22	.24	.22	.24	.21	.24
Carbonate, 52-54% 400 lb bbls	lb.	...	.1610	.1610	.169	.14½	.169
Chloride, 250 lb bbls	lb.	...	.16	.16	.18	.12½	.18
Cyanide, 100 lb drs	lb.	...	.34	...	.34	...	.34
Oleate, precip, bbls	lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks	lb.	...	.18¾	...	.18¾	.15	.18¾
red 100 lb bbls	lb.	...	.20	...	.20	.15¾	.20
Sub-acetate verdigris, 400 lb bbls	lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks	100 lb.	...	4.60	4.45	4.60	4.10	4.75
Copperas crys and sugar bulk c-l, wks	ton	...	14.00	...	14.00	14.00	16.00
Corn Sugar, tanners, bbls	100 lb.	...	3.19	2.99	3.19	2.89	3.19
Corn Syrup, 42°, bbls	100 lb.	...	3.22	3.02	3.22	2.92	3.17
43°, bbls	100 lb.	...	3.27	3.07	3.27	2.97	3.22
Cotton, Soluble, wet, 100 lb bbls	lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls	lb.	.30¾	.31¼	.28¼	.31¼	.22¼	.25¾
Creosote, USP 42 lb cbys	lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1 tks	gal.	.13½	.14	.13½	.14	.13½	.14
Grade 2	gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs	lb.	.09¾	.10¼	.09¾	.10¼	.09½	.10½
Crotonaldehyde, 97%, 55 and 110 gal drs, wks	lb.	.11	.12	.11	.12	.11	.22*
Cutch, Philippine, 100 lb bale	lb.	...	.04½	.04	.04½	.04	.04½
Cyanamid, pulv, bags, c-l, frt all'd, nitrogen basis, unit		...	1.27½	..	1.27½	...	1.27½
D							
Derris root 5% rotenone, bbls	lb.	.24	.30	.24	.30	.24	.30
Dextrin, corn, 140 lb bgs f.o.b., Chicago	100 lb.	...	3.60	3.40	3.60	3.30	3.75
British Gum, bgs	100 lb.	...	3.85	3.65	3.85	3.55	3.95
Potato, Yellow, 220 lb bgs	lb.	...	.07¾	...	.07¾	.07	.08¾
White, 220 lb bgs, lcl	lb.	.08½	.09	.08½	.09	.08	.09
Tapioca, 200 bgs, lcl	lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs	100 lb.	...	3.55	3.35	3.65	3.25	3.70
Diamylamine, c-l, drs, wks	lb.	...	.47	...	.47	...	.47
lcl drs, wks	lb.	...	.50	...	.50	...	.50
tks, wks	lb.	...	.45	...	.45	...	.45
Diamylene, drs, wks	lb.	.095	.102	.095	.102	.095	.102
tks, wks	lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs	lb.	.085	.092	.085	.092	.085	.092
tks, wks	lb.	...	.075	...	.075	...	.075
Oxalate, lcl, drs, wks	lb.	...	.30	...	.30	...	.30
Diamylphthalate, drs, wks	lb.	.21	.21½	.21	.21½	.19	.21
Diamyl Sulfide, drs, wks	lb.	...	1.10	...	1.10	...	1.10
Diatomaceous Earth, see Kieselguhr.							
Dibutoxy Ethyl Phthalate, drs, wks	lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks	lb.	.51	.53	.51	.53	.53	.55
c-l drs, wks	lb.	...	.50	...	.50	...	...
tks, wks	lb.	...	.48	...	.48	...	...
Dibutyl Ether, drs, wks, lcl	lb.	.24½	.25	.24½	.25	.24½	.25
Dibutylphthalate, drs, wks, frt all'd	lb.	.19	.19½	.19	.19½	.19	.19½
Dibutyltartrate, 50 gal drs	lb.	...	.50	...	.50	.45	.54
Dichlorethylene, drs	lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks	lb.	.15	.16	.15	.16	.15	.16
tks, wks	lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks	lb.	...	.23	...	.23	...	.23
Dichloropentanes, drs, wks	lb.	...	.0221	...	.0221	no prices	
tks, wks	lb.	...	.025	...	.025	no prices	
Diethanolamine, tks, wks	lb.	...	.22½	...	.22½	.22½	.23
Diethylamine, 400 lb drs, lcl, f.o.b., wks	lb.	...	.70	...	.70	.70	3.00
Diethylaniline, 850 lb drs	lb.	.40	.52	.40	.52	.40	.52
Diethyl Carbinol, drs	lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs	lb.	...	.25	...	.25	.31¾	.35
Diethylorthotoluidin, drs	lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, 1000 lb drs	lb.	.19	.19½	.19	.19½	.19	.19½
Diethylsulfate, tech, drs, wks, lcl	lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs	lb.	.14½	.15½	.14½	.15½	.14½	.17
Mono ethyl ethers, drs	lb.	.14½	.15½	.14½	.16	.15	.16
tks, wks	lb.	...	.13½	...	.13½	.13½	.14
Mono butyl ether, drs	lb.	.22½	.24½	.22½	.24½	.23	.24
tks, wks	lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks	lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls	lb.	...	.16	.16	.21	.15	.23
Oleate, bbls	lb.	...	.17	.17	.17	.13	.20
Stearate, bbls	lb.	...	.22	.22	.26	.20	.28
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis	lb.	...	1.00	...	1.00	...	1.00
Dimethylaniline, 340 lb drs	lb.	.23	.24	.23	.24	.23	.24
Dimethyl Ethyl Carbinol, drs	lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs, wks, frt all'd	lb.	...	.18½	...	.18½	...	.19
Dimethylsulfate, 100 lb drs	lb.	.45	.50	.45	.50	.45	.50

j A delivered price; * Depends upon point of delivery; † New bulk price, tank cars ¼c per lb. less than bags in each zone.

k Higher price is for purified material; * These prices were on a delivered basis.

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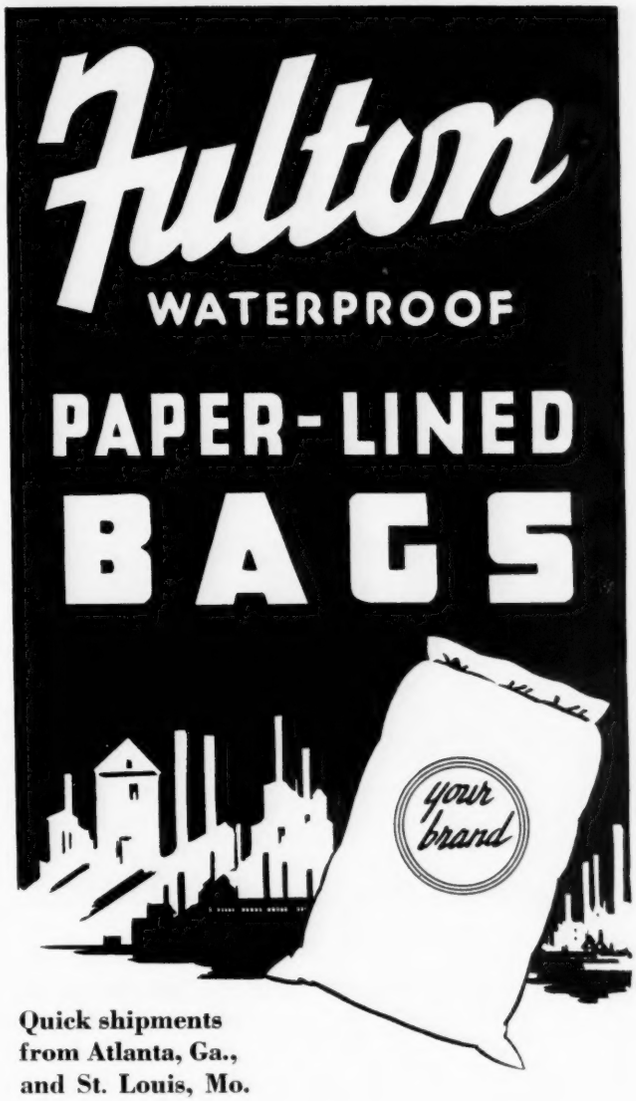
	Current Market	1940 Low	1940 High	1939 Low	1939 High
Dinitrobenzene, 400 lb bbls lb. *k*	...	.18	.18	.19	.16	.19
Dinitrochlorobenzene, 400 lb bbls lb.	...	.14	...	.14	.13½	.14
Dinitronaphthalene, 350 lb bbls lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	.22	.22	.23	.22	.24
Dinitrotoluene, 300 lb bbls lb.	...	.15½	...	.15½	...	.15½
Diphenyl, bbls lb.	.15	.20	.15	.20	.15	.25
Diphenylamine lb.	...	.25	.25	.32	.32	.32
Diphenylguanidine, 100 lb drs lb.	.35	.37	.35	.37	.31	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	...	nom.	...	nom.	...	nom.
Extract lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
E						
Egg Yolk, dom., 200 lb cases lb.	.57	.59	.57	.62	.59	.69
Epsom Salt, tech, 300 lb bbls c-l, NY 100 lb.	1.90	2.10	1.90	2.10	1.90	2.10
USP, c-l, bbls 100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs lb.	...	.26	...	.26	.22	.23
Isopropyl 50 gal drs lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd lb.	...	.06	...	.06	...	.06
Nitrous conc bottles lb.	...	.68	...	.68	...	.68
Synthetic, wks, drs lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd' lb.	...	.07	.07	.06½	.051	.061
drs, frt all'd lb.	...	.08	.07½	.08	.061	.08
99%, tks, frt all'd lb.	...	.07¼	.0685	.07¼	.0585	.0685
drs, frt all'd lb.	...	.08¼	.0785	.08¼	.0685	.0785
Acetoacetate, 110 gal drs lb.	...	.27½	...	.27½	...	.27½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd lb.	.45	.50	.45	.50	.45	.50
Chloride, 200 lb drs lb.	.18	.20	.18	.20	.22	.24
Chlorocarbonate, cbys lb.	...	.30	...	.30	...	.30
Crotonate, drs lb.	...	.35	...	.35	.35	.75
Formate, drs, frt all'd. lb.	.23	.24	.23	.24	.27	.28
Lactate, drs, wks lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks lb.	...	.25	...	.25	.30	.34
Oxybutyrate, 50 gal drs, wks lb.	1.00	nom.	.30	1.00	.30	.30½
Silicate, drs, wks lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont lb.	.75	.85	.75	.85	.75	.85
Anhydrous lb.	...	.75	...	.75	...	.75
Dichloride, 50 gal drs, wks lb.	.0595	.0694	.0595	.0694	.0545	.0994
Glycol, 50 gal drs, wks lb.	.14½	.18½	.14½	.18½	.14½	.21
tks, wks lb.	...	.13½	...	.13½	.13½	.16
Mono Butyl Ether, drs, wks lb.	.16½	.21	.16½	.21	.16½	.22
tks, wks lb.	...	.15½	...	.15½	.15½	.19
Mono Ethyl Ether, drs, wks lb.	.14½	.15	.14½	.15	.14½	.17
tks, wks lb.	...	.13½	...	.13½	.13½	.15
Mono Ethyl Ether Acetate, drs, wks lb.	.11½	.13	.11½	.13	.11½	.14
tks, wks lb.	...	.10½	...	.10½	.10½	.13
Mono Methyl Ether, drs wks lb.	.16	.17	.16	.17	.16	.22
tks, wks lb.	...	.14½	...	.14½	.14½	.17
Oxide, cyl lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline lb.	45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks ton	14.00	17.50	14.00	17.50	14.00	14.50
Ferric Chloride, tech, crys, 475 lb bbls lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Fish Scrap, dried, unground wks unit *l*	...	4.25	...	4.25	3.00	4.25
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis unit *m*	...	3.00	...	3.00	2.35	3.00
Fluorspar, 98% bgs lb.	...	32.60	...	32.60	30.00	33.00
Formaldehyde, USP, 400 lb bbls, wks lb.	.05¾	.06¼	.05¾	.06¼	.05¾	.06¼
Fossil Flour lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines ton	...	15.00	...	15.00	10.00	11.00
Imp powd, c-l, bgs ton	no prices		...	25.00	23.00	30.00
Furfural (tech) drs, wks lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.17¼	.16	.17¼	.12½	.17¼
Fustic, crystals, 100 lb boxes lb.	.24	.25	.24	.28	.22	.28
Liquid 50°, 600 lb bbls lb.	.10½	.14	.10½	.14	.09½	.14
Solid, 50 lb boxes lb.	.19	.21	.19	.21	.17½	.21
G						
G Salt paste, 360 lb bbls lb.	...	.45	.45	.47	.45	.47
Gambier, com 200 lb bgs lb.	...	.07	...	.07	.06¾	.07¼
Singapore cubes, 150 lb bgs 100 lb.	...	.10	...	.10	.08	.10
Gelatine, tech, 100 lb cs lb.	.42	.43	.42	.43	.42	.50
Glauber's Salt, tech, c-l, bgs, wks* 100 lb.	.95	1.18	.95	1.18	.95	1.18
Anhydrous, see Sodium Sulfate						

l + 10; m + 50; * Bbls. are 20c higher.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Glue, bone, com grades, c-l bgs ... lb.	.13½	.15	.13½	.15½	.13½	.15½
Better grades, c-l, bgs lb.	.15	.23	.15	.23	.11½	.15½
Glycerin, CP, 550 lb drs lb.	...	.12½	...	.12½	...	.12½
Dynamite, 100 lb drs ... lb.	...	nom.	...	nom.	...	.09
Saponification, drs ... lb.	...	.13	...	.13	.08½	.10
Soap Lye, drs ... lb.	.07¾	.08¼	.07¾	.08¼	.07½	.07⅞
Glyceryl Bori-Borate, bbls lb.	...	.40	...	.40	...	.40
Monoricinoleate, bbls ... lb.	...	.27	...	.27	...	.27
Monostearate, bbls ... lb.	...	.30	...	.30	...	.30
Oleate, bbls ... lb.	...	.22	...	.22	...	.22
Phthalate ... lb.	...	.37	...	.37	...	.37
Glyceryl Stearate, bbls ... lb.	...	.18	...	.18	.24	.27½
Glycol Bori-Borate, bbls.. lbs.	...	.22	...	.22	.22	.23
Phthalate, drs ... lb.	...	.38	...	.38	.38	.40
Stearate, drs ... lb.	...	.26	...	.26	...	.26
GUMS						
Gum Aloes, Barbadoes ... lb.	.85	.90	.85	.90	.85	.90
Arabic, amber sorts ... lb.	.12¼	.12¾	.12¼	.14	.09	.24
White sorts, No. 1, bgs lb.	.33	.35	.33	.35	.23	.35
No. 2, bgs ... lb.	.32	.34	.32	.34	.21	.34
Powd, bbls ... lb.	.16¼	.18¾	.16¼	.17	.12½	.27
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY ... lb.	.04½	.06	.02½	.10½	.02½	.10½
California, f.o.b. NY, drs ton	29.00	55.00	29.00	55.00	29.00	55.00
Egyptian, 200 lb cases, f.o.b. NY ... lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases ... lb.	.20	.21	.20	.24	.17	.34
Copal, Congo, 112 lb bgs, clean, opaque ... lb.	...	.29½	...	.29½	.18¼	.29½
Dark amber ... lb.	...	.11⅜	...	.11⅜	.07⅛	.11⅜
Light amber ... lb.	...	.17	...	.17	.11¼	.17
Copal, East India, 180 lb bgs						
Macassar pale bold ... lb.	...	.13⅞	.13⅞	.15⅝	.11⅜	.15¼
Chips ... lb.	...	.07⅞	.07⅞	.09	.05⅜	.08½
Dust ... lb.	...	.04¾	.04¾	.06¾	.03¼	.07⅛
Nubs ... lb.	...	.11¾	.11¾	.14⅜	.09½	.13¾
Singapore, Bold ... lb.	...	.14⅝	.14⅝	.17½	.14	.18¼
Chips ... lb.	...	.08⅜	.08⅜	.09⅛	.05⅝	.10¼
Dust ... lb.	...	.04¾	.04¾	.06¾	.03¼	.07⅛
Nubs ... lb.	...	.11	.11	.13½	.09⅜	.14⅜
Copal Manila, 180-190 lb baskets, Loba A ... lb.	...	.14¼	.14¼	.17⅜	.10½	.14⅞
Loba B ... lb.	...	.13¾	.13¾	.16¾	.09¾	.14½
Loba C ... lb.	...	.13½	.13½	.16⅛	.09	.14⅛
DBB ... lb.	...	.12¾	.12¾	.14½	.07⅞	.12½
Dust ... lb.	...	.06⅞	.06⅞	.08¾	.05⅛	.08½
MA sorts ... lb.	...	.10⅜	.10⅜	.13¾	.05⅞	.11
Copal Pontianak, 224 lb cases, bold genuine .. lb.	...	.16¾	.16¾	.18½	.15¼	.18½
Chips ... lb.	...	.08⅜	.08⅜	.10½	.07⅛	.11½
Mixed ... lb.	...	.16⅝	...	.16⅝	.13⅜	.16⅝
Nubs ... lb.	...	.10¾	.10¾	.13½	.10½	.14⅜
Split ... lb.	...	.16⅛	...	.16⅛	.12	.16⅛
Damar Batavia, 136 lb cases						
A ... lb.	...	.21⅝	.21⅝	.22¾	.20	.23¾
B ... lb.	...	.20⅛	.20⅛	.21⅛	.18½	.21⅛
C ... lb.	...	.14⅝	.15⅝	.15¼	.13½	.15⅝
D ... lb.	...	.13¼	.13¼	.13¾	.12¼	.14¼
A/D ... lb.	...	.13⅞	.13⅞	.14½	.12¾	.15¼
A/E ... lb.	...	.12⅞	.12⅞	.13⅜	.11⅜	.13¾
E ... lb.	...	.10	.10	.10⅜	.07⅛	.10
F ... lb.	...	.08	.08	.08¾	.07¼	.08¾
Singapore, No. 1 ... lb.	...	.16⅞	.16⅞	.19⅝	.13¾	.19½
No. 2 ... lb.	...	.12¾	.12¾	.15¾	.10½	.16⅜
No. 3 ... lb.	...	.07⅛	.07⅛	.09	.05¼	.09⅛
Chips ... lb.	...	.11	.11	.12½	.09¼	.12½
Dust ... lb.	...	.07⅛	.07⅛	.09	.05¼	.09⅛
Seeds ... lb.	...	.09⅞	.09⅞	.10½	.07⅜	.10½
Elemi, cns, c-l ... lb.	...	.10⅛	.10⅛	.11⅝	.08⅛	.12⅝
Ester ... lb.	.06¼	.06¾	.06¼	.06¾	.06	.07
Gamboge, pipe, cases ... lb.	.70	.75	.70	.75	.55	.80
Powd, bbls ... lb.	.75	.80	.75	.80	.60	.85
Ghatti, sol, bgs ... lb.	.11	.15	.11	.15	.11	.15
Karaya, bbls, bxs, drs ... lb.	.14	.33	.14	.33	.14	.33
Kauri, NY						
Brown XXX, cases ... lb.	...	.60	...	60	.60	.60½
BX ... lb.	...	.38	...	.38	...	.38
B1 ... lb.	...	.28	...	.28	...	.28
B2 ... lb.	...	.24	...	.24	...	.24
B3 ... lb.	...	.18½	...	.18½	...	.18½
Pale XXX ... lb.	...	.61	...	.61	...	.61
No. 1 ... lb.	...	.41	...	.41	...	.41
No. 2 ... lb.	...	.24	...	.24	...	.24
No. 3 ... lb.	...	.17¾	...	.17¾	...	.17¾
Kino, tins ... lb.	4.00	4.50	4.00	4.50	2.50	4.50
Mastic ... lb.	.85	.90	.85	.90	.55	.90
Sandarac, prime quality, 200 lb bgs & 300 lb cks.. lb.	...	.37	...	.37	.15	.37
Senegal, picked bags ... lb.	...	.30	...	.30	.25	.30
Sorts ... lb.	...	.13	...	.13	.09¼	.13
Thus, bbls ... 280 lbs.	15.00	15.25	15.00	15.25	13.50	15.25
Tragacanth, No. 1, cases.. lb.	2.65	2.70	2.65	2.70	2.25	2.50
No. 2 ... lb.	2.55	2.60	2.55	2.60	1.90	2.40
No. 3 ... lb.	2.45	2.50	2.45	2.50	1.60	2.25
Yacca, bgs ... lb.	.03½	.04	.03½	.04	.03½	.08
H						
Helium, cyl (200 cu. ft.) cyl.	...	25.00	...	25.00	...	25.00
Hematine crystals, 400 lb bbls lb.	.20	.30	.20	.30	.20	.34
Hemlock, 25%, 600 lb bbls. wks ... lb.	...	.03⅜	.03½	.03⅜	.03	.03⅜
tks ... lb.	...	.03	...	.03	.02⅝	.02¾
Hexalene, 50 gal drs, wks lb.	...	.80	...	.80	...	.30



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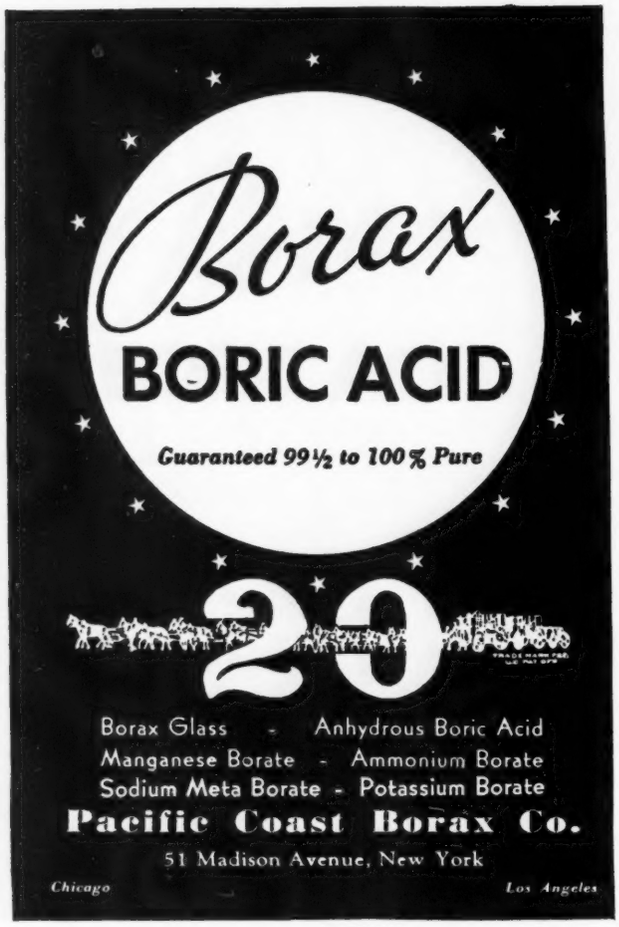

ESTABLISHED 1880

WM. S. GRAY & CO.

342 MADISON AVE. NEW YORK

Murray Hill 2-3100 Cable: Graylime

Acetic Acid—Acetate of Lime
Acetate of Soda
Acetone C. P.
Butyl Alcohol—Butyl Acetate
Methanol—Methyl Acetone
Formaldehyde
Denatured Alcohol
Turpentine
Rosin
Phenol U. S. P.
Benzol
Toluol
Xylol
Whiting
Magnesium Carbonate
Magnesium Oxide
Precipitated Chalk

Anti-Freeze—Methanol and Alcohol

		Current Market	1940 Low	1940 High	1939 Low	1939 High
Hexane, normal 60-70° C. Group 3, tks	gal.	...	.10½	...	.10½	...	.10½
Hexamethylenetetramine, powd, drs	lb.	.32	.33	.32	.33	.32	.36
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13	.13½	.13	.13½
tks	lb.	...	.12	...	.12	...	.12
Hoof Meal, f.o.b. Chicago unit		2.50	2.75	2.50	3.15	2.50	3.25
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	...	.20	...	.20	.19½	.20
Hydroxylamine Hydrochloride	lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls	lb.	...	.14	...	.14	.13	.21
I							
Indigo, Bengal, bbls	lb.	1.63	1.67	1.63	1.67	...	2.40
Synthetic, liquid	lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars	lb.	...	2.00	...	2.00	1.75	2.00
Irish Moss, ord, bales	lb.	.15	.16	.15	.16	.10	.10
Bleached, prime, bales	lb.	.28	.30	.28	.30	.19	.20
Iron Acetate Liq. 17°, bbls delv	lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.							
Nitrate, coml, bbls	100 lb.	2.75	3.00	2.75	3.00	2.32	3.11
Isobutyl Carbinol (128-132° C) drs, wks	lb.	.33	.34	.33	.34	.33	.34
tks, wks	lb.	...	.32	...	.32	...	.32
Isopropyl Acetate, tks, frt all'd	lb.	...	.06	.05½	.06	.051	.06
drs, frt all'd	lb.	.07	.07½	.06½	.07½	.061	.07
Ether, see Ether, isopropyl.							
Keiselguhr, dom bags, c-l, Pacific Coast	ton	22.00	35.00	22.00	35.00	22.00	35.00
L							
Lead Acetate, f.o.b. NY, bbls, White, broken	lb.	...	.11	...	.11	.10	.11
cryst, bbls	lb.	...	.11	...	.11	.10	.11
gran, bbls	lb.	...	.11¾	...	.11¾	.10¾	.11¾
powd, bbls	lb.	...	.11¾	...	.11¾	.10¾	.11¾
Arsenate, East, drs	lb.	...	.08½	.08½	.11	.10	.11½
Linoleate, solid, bbls	lb.	...	.19	...	.19	...	.19
Metal, c-l, NY	100 lb.	5.05	5.10	5.05	5.25	4.75	5.55
Nitrate, 500 lb bbls, wks	lb.	.11	.14	.11	.14	.10	.12
Oleate, bbls	lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv	lb.	.07¾	.08	.07½	.08	.07¼	.08½
97% Pb_3O_4, delv	lb.	.08	.08¼	.07¾	.08¼	.07½	.0835
98% Pb_3O_4, delv	lb.	.08¼	.08¾	.08	.08¾	.07¾	.0860
Resinate, precip, bbls	lb.	...	.16½	...	.16½	...	.16½
Stearate, bbls	lb.	...	.26	...	.26	.22	.25
Titanate, bbls, c-l, f.o.b. wks, frt all'd	lb.	.10	.10¼	.10	.10¼	.11	.11½
White, 500 lb bbls, wks,	lb.	...	.07	...	.07	...	.07
Basic sulfate, 500 lb bbls, wks	lb.	.06¼	.06½	.06¼	.06½	...	.06¼
Lime, chemical quicklime, f.o.b., wks, bulk	ton	7.00	13.00	7.00	13.00	7.00	8.00
Hydrated, f.o.b. wks	ton	8.50	16.00	8.50	16.00	8.50	12.00
Lime Salts, see Calcium Salts							
Lime, sulfur, dealers, tks	gal.	.08½	.10½	.08	.11½	.08	.11½
drs	gal.	.10½	.12	.11	.16	.11	.16
Linseed Meal, bgs	ton	...	34.00	34.00	37.00	34.00	42.00
Litharge, coml, delv, bbls	lb.	.06¾	.07	.06½	.06¾	.06¼	.071
Lithopone, dom, ordinary, delv, bgs	lb.	...	.036	...	.036	.03¾	.04½
bbls	lb.	...	.03¾	...	.03¾	.04	.04¾
High strength, bgs	lb.	...	.05	...	.05	.05¼	.05¾
bbls	lb.	...	.05¼	...	.05¼	.05½	.05¾
Titanated, bgs	lb.	...	.05	...	.05	.05¼	.05¾
bbls	lb.	...	.05¼	...	.05¼	.05½	.05¾
Logwood, 51°, 600 lb bbls	lb.	.10½	.12½	.10½	.12½	.09½	.12½
Solid, 50 lb boxes	lb.	.16½	.20½	.16½	.20½	.15	.20½
M							
Madder, Dutch	lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls	ton	58.00	62.00	58.00	66.00	58.00	66.00
Magnesium Carb, tech, 70 lb bgs, wks	lb.	...	.06¼	...	.06¼	.05¼	.06½
Chloride flake, 375 lb bbls, c-l, wks	ton	32.00	42.00	32.00	42.00	39.00	42.00
Fluosilicate, crys, 400 lb bbls, wks	lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, calc tech, heavy bbls, frt all'd	lb.	...	.26	.25	.30	.25	.30
Light bbls above basis	lb.	...	.26	.20	.26	.20	.25
USP Heavy, bbls, above basis	lb.	.25	.30	.25	.30	.25	.30
Palmitate, bbls	lb.	.33	nom.	.33	nom.	.33	nom.
Silicofluoride, bbls	lb.	.11	.11½	.11	.11½	.09½	.11½
Stearate, bbls	lb.	.24	.27	.24	.27	.21	.24
Manganese, acetate, drs	lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls	lb.	.15	.16	.15	.16	.15	.16
Chlorate, 600 lb cks	lb.	...	.08½	...	.08½	.07½	.12
Dioxide, tech (peroxide), paper bags, c-l	ton	...	66.50	...	66.50	47.50	66.50
Hydrate, bbls	lb.	...	.82	...	.82	...	.32
Linoleate, liq, drs	lb.	.18	.19½	.18	.19½	.18	.19¼
solid, precip, bbls	lb.	...	.19	...	.19	...	.19
Resinate, fused, bbls	lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs	lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs	lb.	.08	.08½	.08	.08½	.07	.08½
Mangrove, 55%, 400 lb bbls	lbs.	...	...	...	...	...	.04
Bark, African	ton	...	31.50	31.50	35.00	23.00	35.00

		Current Market	1940 Low	1940 High	1939 Low	1939 High
Mannitol, pure cryst, cs, wks	lb.	.95	1.00	.95	1.00	.95	1.20
commercial grd, 250 lb bbls	lb.	.42	.50	.42	.50	.42	.57
Marble Flour, blk	ton	12.00	14.00	12.00	14.00	12.00	14.00
Mercury chloride(Calomel)	lb.	...	2.70	2.45	2.70	1.36	2.57
Mercury metal ..76 lb. flasks		183.00	228.00	180.00	228.00	95.00	170.00
Mesityl Oxide, f.o.b. dest., tks	lb.	...	.15	...	.15	.10½	.15
drs, c-l	lb.	...	.16	...	.16	.11½	.16
drs, lcl	lb.	...	.16½	...	.16½	.12	.16½
Meta-nitro-aniline	lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls	lb.	...	1.30	1.30	1.40	1.30	1.55
Meta-phenylene diamine 300 lb bbls	lb.	...	.65	...	.65	.80	.84
Meta-toluene-diamine 300 lb bbls	lb.	...	.65	.65	.67	.65	.67
Methanol, denat, grd, drs, c-l frt all'd	gal.	...	.45	...	.45	.41	.46
tks, frt all'd	gal.	...	.40	...	.40	.35	.40
Pure, drs, c-l, frt all'd'	gal.	...	.38	...	.38	...	.38
tks	gal.	...	.33	...	.33	...	.33
95%, tks	gal.	...	.31	...	.31	...	.31
97%, tks	gal.	...	.32	...	.32	...	.32
Methyl Acetate, tech tks, delv	lb.	.06	.07	.06	.07	.06	.06½
55 gal drs, delv	lb.	.07	.08	.07	.08	.07	.08
C.P. 97-99%, tks,delv	lb.	.09½	10½	.09½	.10½	...	.06¼
55 gal drs, delv	lb.	.10½	.11½	.10½	.11½	.07¼	.07¾
Acetone, frt all'd, drs	gal. ♭	.41	.44	.41	.44	.30	.44
tks, frt all'd, drs	gal. ♭	.35	.39	.35	.39	.25	.35
Synthetic, frt all'd, east of Rocky M., drs	gal. ♭	...	.44	.38	.44	.38	.41
tks, frt all'd	gal.	...	.36	...	.36	...	.31½
West of Rocky M., frt all'd, drs	gal. ♭	...	.48	.42	.48	...	.42
tks, frt all'd	gal. ♭	...	.39½	.35	.39½	...	.35
Anthraquinone	lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks	lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb lots, frt all'd	lb.	...	.70	...	.70	...	...
less than 100 lbs. f.o.b. wks	lb.	...	.75	...	.75	...	...
Chloride, 90 lb. cyl	lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks,frt all'd	lb.	...	.06	.05½	.06	.05	.05½
50 gal drs, frt all'd' c-l	lb	.07	.07½	.06½	.07½	.06	.07
Formate, drs, frt all'd	lb.	...	.89	...	.89	.35	.39
Hexyl, Ketone, pure, drs	lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd	lb.	...	.80	...	.80	...	.30
Mica, dry grd, bgs, wks	ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs	lb.	...	2.50	...	2.50	...	2.50
Monoamylamine,c-l,drs,wks	lb.	...	.52	...	.52	...	.52
lcl, drs, wks	lb.	.53	.55	.53	.55	...	...
tks, wks	lb.	...	.50	...	.50	...	...
Monobutylamine, drs, c-l, wks	lb.	...	.50	...	.50	.50	.65
lcl, wks	lb.	.51	.53	.51	.53	...	...
tks, wks	lb.	...	.48	...	.48	...	...
Monochlorobenzene, see "C"							
Monoethanolamine, tks, wks	lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks	lb.	...	.65	...	.65	...	...
Monomethylamine, drs, frt all'd, E Mississippi, c-l	lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs	lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, lcl wks	lb.	...	.75	...	.75	...	...
Myrobalans 25%, liq bbls	lb.	no prices		no prices		.03¼	.04¼
50% Solid, 50 lb boxes	lb.	no prices		no prices		.04¼	.05
J1 bgs	ton	...	28.50	28.50	32.00	24.00	50.00
J2 bgs	ton	...	23.50	23.00	25.00	19.00	41.00
N							
Naphtha, v.m.&p. (deodorized) see petroleum solvents.							
Naphtha, Solvent, water-wht, tks	gal.	...	.27	...	.27	.26	.27
drs, c-l	gal.	...	.32	...	.32	.31	.32
Naphthalene, dom, crude bgs, wks	lb.	2.25	2.75	2.25	2.75	2.25	2.85
imported, cif, bgs	lb.	...	3.00	...	3.00	1.50	1.85
Balls, flakes, pks	lb.	.06¾	.07½	...	.07½	.06½	.07½
Balls, ref'd, bbls, wks	lb.	...	.06¾	...	.06¾	.05¾	.06¾
Flakes, ref'd, bbls, wks	lb.	...	.06¾	...	.06¾	.05¾	.06¾
Nickel Carbonate, bbls	lb.	.36	.36½	.36	.36½	.36	.37½
Chloride, bbls	lb.	.18	.20	.18	.20	.18	.20
Metal ingot	lb.	...	.35	...	.35	...	.35
Oxide, 100 lb kgs, NY	lb.	.35	.38	.35	.38	.35	.37
Salt, 400 lb bbls, NY	lb.	.13	.13½	.13	.13½	.13	.13½
Single, 400 lb bbls, NY	lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, 40%, drs, sulfate, 55 lb drs	lb.	...	.70	...	.70	.70	.76
Nitre Cake, blk	ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled,1000 lb drs, wks	lb.	.08	.09	.08	.10	.08	.10
tks	lb.	...	.07	...	.07	.07	.07½
Nitrocellulose, c-l, lcl, wks	lb.	.22	.29	.22	.29	.22	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis		...	1.2158	...	1.2158	...	1.2158
NitrogenousMat'l,bagsimp	unit	...	2.45	2.45	2.60	2.25	2.85
dom, Eastern wks	unit	...	2.50	2.50	2.90	2.30	3.00
dom. Western wks	unit	...	1.95	1.95	2.00	1.90	2.25
Nitronaphthalene, 550 lb bbls	lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs	lb.	.29	.32	.29	.30	.22	.23

a Country is divided in 4 zones, prices varying by zone; ♭ Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila., or N. Y.

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Need a wax with a high melting point?

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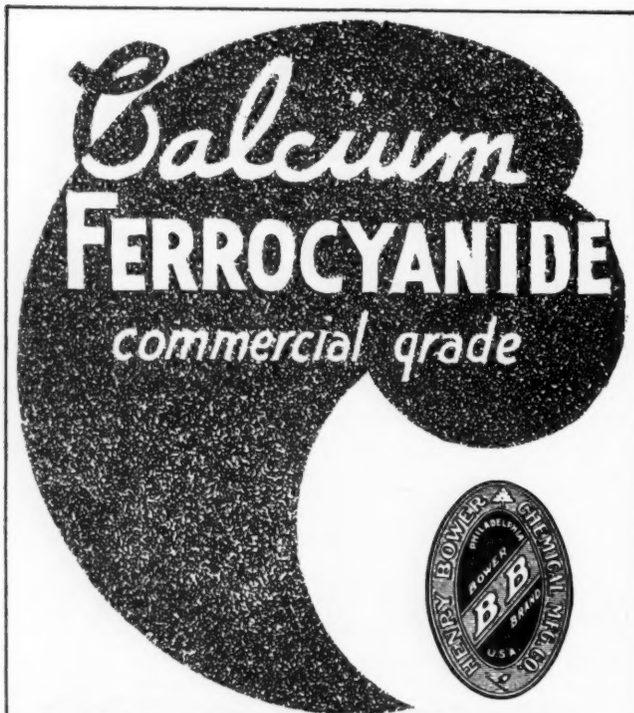

HENRY BOWER CHEMICAL

MANUFACTURING COMPANY

29th & GRAY'S FERRY ROAD

PHILADELPHIA, PA.

Oak Bark Extract
Phloroglucinol

Prices

		Current Market		1940 Low	1940 High	1939 Low	1939 High
Oak Bark Extract, 25%, bbls	lb.	.03⅛	.03⅜	.03⅛	.03⅜	.03⅛	.03⅜
tks	lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks	lb.	...	.15	...	.15	.15	.17
Orange-Mineral, 1100 lb cks NY	lb.	.10¾	.12	.10½	.12	.10¼	.10¾
Orthoaminophenol, 50 lb kgs	lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs	lb.	...	.70	.70	.74	.70	.74
Orthochlorophenol, drs	lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks	lb.	.16	.16½	.16	.16½	.14½	.17
Orthodichlorobenzene, 1000 lb drs	lb.	.06	.07	.06	.07	.06	.07
Orthonitrochlorobenzene, 1200 lb drs, wks	lb.	.15	.18	.15	.18	.15	.18
Orthonitroparachlorphenol, tins	lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs	lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks	lb.	...	.09	...	.09	.08	.10
Orthotoluidine, 350 lb bbls, lcl	lb.	...	.19	...	.19	.16	.19
Osage Orange, cryst, bbls	lb.	...	.21	...	.21	.17	.25
51° liquid	lb.	...	.10	...	.10	.07	.09
P							
Paraffin, rfd, 200 lb bgs 122-127° M P	lb.	.066	.0675	.066	.0675	.03¾	.06¼
128-132° M P	lb.	.068	.0705	.068	.0705	.04	.0705
133-137° M P	lb.	.073	.0755	.073	.0755	.0465	.0755
Para aldehyde, 99%, tech, 110-55 gal drs, wks	lb.	.10	.11¼	.10	.11¼	.10	.16*
Aminoacetanilid, 100 lb kgs	lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs	lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs	lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs	lb.	...	.32	...	.32	.30	.45
Dichlorobenzene 200 lb drs, wks	lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks	lb.	.34	.35	.34	.35	.34	.35
Nitroacetanilid, 300 lb bbls	lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wk	lb.	...	.47	...	.47	.45	.47
Nitrochlorobenzene, 1200 lb drs, wks	lb.	...	.15	.15	.16	.15	.16
Nitro-orthotoluidine, 300 lb bbls	lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls	lb.	...	.35	.35	.37	.35	.37
Nitrosodimethylaniline, 120 lb bbls	lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls	lb.	...	.30	...	.30	.30	.35
Phenylenediamine, 350 lb bbls	lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls	lb.	...	.70	.70	.75	.70	.75
tks, wks	lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks	lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks	lb.	...	.48	.48	.50	.48	.58
Paris Green, dealers, drs	lb.	.23	.26	.23	.26	.23	.26
Pentane, normal, 28-38° C, group, 3 tks	gal.	...	.08½	...	.08½	...	.08½
drs, group 3	gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 100 lb drs, frt all'd	lb.	.08	.08½	.08	.08¾	.08	.10½
Petrolatum, dark amber, bbls	lb.	.03¾	...	.03¾	.05	.02½	.05
White, lily, bbls	lb.	.06¼	.07¾	.07	.08½	.05¼	.08½
White, snow, bbls	lb.	.07¼	.08¾	.08	.09½	.06¼	.09½
Petroleum Ether, 30-60°, group 3, tks	gal.	...	.13½	...	.13½	.13	.13½
drs, group 3	gal.	.14½	.25½	.14½	.25½	.14	.25½
PETROLEUM SOLVENTS AND DILUENTS							
Cleaners naphthas, group 3, tks, wks	gal.	06⅞	.07	.06⅞	.07	.06⅜	.07
East Coast, tks wks	gal.	.09	.10½	.09	.10½	.09	.10
Hydrogenated, naphthas, frt all'd East, tks	gal.	...	.16	...	.16	...	.16
No. 2, tks	gal.	...	.18	...	.18	...	.18
No. 3, tks	gal.	...	.16	...	.16	...	.16
No. 4, tks	gal.	...	.18	...	.18	...	.18
Lacquer diluents, tks, East Coast	gal.	.09½	.10	.09½	.10	.09	.12½
Group 3, tks	gal.	...	.07⅞	...	.07⅞	.07⅜	.08
Naphtha, V.M.P., East tks, wks	gal.	...	.09½	...	.09½	.09	.10
Group 3, tks, wks	gal.	.06⅞	.07	.06⅞	.07	.06⅜	.07
Petroleum thinner, 43-47, East, tks, wks	gal.	.08¾	.09½	.08¾	.09½	.08½	.10
Group 3, tks, wks	gal.	.05⅞	.06	.05⅞	.07	.05⅜	.06
Rubber Solvents, stand grd, East, tks, wks	gal.	...	.09½	...	.09½	.09	.10
Group 3, tks, wks	gal.	.06⅞	.07	.06⅞	.07	.06⅜	.07
Stoddard Solvents, East, tks, wks	gal.	.08¾	.09½	.08¾	.09½	.08½	.10
Group 3, wks	gal.	.06⅜	.06½	.06⅜	.06½	.05⅞	.06½
Phenol, 250-100 lb drs	lb.	.13	.14¾	.13	.14¾	.13	.15½
tks, wks	lb.	...	.12	...	.12	.12	.13½
Phenyl-Alpha-Naphthylamine, 100 lb kgs	lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs	lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com	lb.		1.50	...	1.50	...	1.50
Phloroglucinol, tech, tins	lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons	lb.	20.00	22.00	20.00	22.00	20.00	22.00

* These prices were on a delivered basis.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Phosphate Rock, f.o.b. mines					
Florida Pebble, 68% basis ton	...	1.90	1.85	1.90	...	1.85
70% basis .....ton	...	2.15	2.15	2.35	...	2.35
72% basis .....ton	...	2.40	2.40	2.85	...	2.85
75-74% basis .....ton	...	2.90	2.90	3.85	...	3.85
75% basis .....ton	...	5.50	...	5.50	...	5.50
Tennessee, 72% basis..ton	...	4.50	...	4.50	...	4.50
Phosphorus Oxychloride 175 lb cyl .....lb.	.15	.18	.15	.20	.16	.20
Red, 110 lb cases .....lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs..lb.	.38	.42	.38	.44	.38	.44
Trichloride, cyl .....lb.	.15	.16	.15	.18	.15	.18
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.24	.30
Phthalic Anhydride, 100 lb drs, wks .....lb.	.14½	.15½	.14½	.15½	...	.14½
Pine Oil, 55 gal drs or bbls						
Destructive dist .....lb.	.53	.56	.53	.56	.46	.48
Steam dist wat wh bbls gal.	...	.59	...	.59	...	.59
tks .....gal.		.54		.54		.54
Pitch Hardwood, wks ...ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbl, wks.....ton	...	19.00	...	19.00	...	19.00
Burgundy, dom, bbls, wks lb.	.05½	.06½	.05½	.06½	.05½	.06½
Imported .....lb.	no prices		no prices		.15	.16
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls .....bbl.	6.00	6.50	6.00	6.50	6.00	6.25
Platinum, ref'd .....oz.	37.00	40.00	37.00	40.00	32.00	40.00
POTASH						
Potash, Caustic, wks, sol..lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06½
flake .....lb.	.07	.07½	.07	.07½	.07	.07⅜
liquid, tks .....lb.	.03½	.03¾	.03½	.03¾	...	.02⅞
Manure Salts, imported 30% basis, blk .....unit	...	.58½	...	.58½	...	.58½
Potassium Abietate, bbls ..lb	...	.08	.08	.09	...	.09
Acetate, tech, bbls, delv lb.	...	.26	...	.26	...	.26
Bicarbonate, USP, 320 lb bbls .....lb.	no prices		...	.18	...	.18
Bichromate Crystals, 725 lb cks* .....lb.	.08⅞	.09¼	.08¾	.09¼	.08¾	.09¼
Binoxalate, 30 lb bbls ..lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks .....lb.	.06½	.06¾	.06½	.07	.06½	.07
liquid, tks .....lb.	...	.03	...	.03	...	.02⅞
drs, wks .....lb.	.03	.03½	.03	.03½	.03	.03½
Chlorate crys, 112 lb kgs, wks .....lb.	.10½	.13	.10½	.13	.09¼	.13
gran, kgs .....lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs .....lb.	.10	.12½	.10	.12½	.08½	.12½
Chloride, crys, bbls ...lb.	.04	nom.	.04	.04¾	.04	.04¾
Chromate, kgs .....lb.	.24	.27	.24	.27	.19	.28
Cyanide, 110 lb cases...lb.	no prices		no prices		.50	.55
Iodide, 250 lb bbls .....lb.	...	1.35	...	1.35	1.13	1.35
Metabisulfite, 300 lb bbls lb.	.13	.15	.13	.15	.11	.18
Muriate, bgs, dom, blk unit	...	.53½	...	.53½	...	.53½
Oxalate, bbls .....lb.	.25	.26	.25	.26	.25	.26
Perchlorate, kgs, wks...lb.	.09½	.11	.09½	.11	.09	.10½
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.18½	.19	.18½	.19½	.18½	.19½
Prussiate, red, bbls ....lb.	.38	.45	.38	.45	.30½	.45
Yellow, bbls .....lb.	.15	.16	.15	.16	.14	.16
Sulfate, 90% basis, bgs ton	...	36.25	...	36.25	36.25	38.00
Titanium Oxalate, 200 lb bbls .....lb.	.40	.45	.40	.45	.35	.45
Pot & Mag Sulfate, 48% basis bgs .....ton	...	24.75	...	24.75	24.75	25.75
Propane, group 3, tks ...lb.	.03¾	.04	.03	.04⅜	.03	.04⅜
Putty, com'l, tubs ...100 lb.	...	3.15	...	6.00	3.00	6.00
Linseed Oil, kgs ...100 lb.	...	5.00	...	4.50	...	4.50
Pyrethrum, conc liq: 2.4% pyrethrins, drs, frt all'd .....gal.	7.15	7.50	7.15	7.50	5.75	7.50
3.6% pyrethrins, drs, frt all'd .....gal.	10.65	11.00	10.65	11.00	8.45	11.00
Flowers, coarse, Japan, bgs .....lb.	.33	.36	.33	.36	.26	.36
Fine powd, bbls .....lb.	.35	.37	.35	.37	.27	.37
Pyridine, denat, 50 gal drs gal.	...	1.71	...	1.71	1.63	1.71
Refined, drs .....lb.	...	.51	...	.51	.50	.51
Pyrites, Spanish cif Atlantic ports, blk .....unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins lb.	2.15	2.40	2.15	2.40	2.15	2.75
Q						
Quebracho, 35% liq tks ..lb.	...	.03½	.03¼	.03½	.02⅞	.03⅜
450 lb bbls, c-l .....lb.	...	.04	...	.04	.04	.04⅛
Solid, 63%, 100 lb bales cif .....lb.	...	.04½	...	.04½	.04	.04½
Clarified, 64% bales .lb.	...	.04¾	...	.04¾	.04¼	.04¾
Quercitron, 51 deg liq, 450 lb bbls .....lb.	.08½	.09½	.08½	.09½	.07½	.08½
Solid, drs .....lb.	.11	.16½	.10	.16½	.10	.12
R						
R Salt, 250 lb bbls, wks lb.	...	.55	...	.55	...	.55
Resorcinol, tech, cans ...lb.	.75	.80	.75	.80	.75	.80
Rochelle Salt, cryst .....lb.	.23¾	.24¼	.22¼	.23¼	.17¾	.21¾
Powd, bbls .....lb.	.22¾	.23¼	.21¾	.22¼	.16¾	.20¼
Rosin Oil, bbls, first run gal.	.45	.50	...	.50	.45	.47
Second run .....gal.	.51	.56	.52	.56	.47	.49
Third run, drs .....gal.	.52	.57	.56	.57	.51	.53
Rosins 600 lb bbls, 280 lb unit ex. yard NY:***						
B	...	6.25	5.90	6.25	4.60	5.45
D	...	6.25	5.90	6.25	4.95	5.70
E	...	6.50	6.25	6.55	5.20	6.40
F	...	6.80	6.30	6.85	5.50	6.75
G	...	6.85	6.50	6.90	5.75	7.00
H	...	6.90	6.70	6.95	5.75	7.10
I	...	6.90	6.75	6.97½	5.77½	7.20

* Spot price is ⅛c higher; *** March 29.

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Glyceryl Monostearate — **Zinc Stearate**
Naphthenic Acid — **Magnesium Laurate**
Calcium Laurate — **Aluminum Stearate**

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THE BEACON CHEMICAL COMPANY MANUFACTURERS

89 BICKFORD STREET • BOSTON, MASS.

		Current Market	1940 Low	1940 High	1939 Low	1939 High
Rosins (continued)						
K	...	6.90	6.85	7.00	5.80	7.20
M	...	6.92½	6.92½	7.02½	5.90	7.25
N	...	6.92½	6.92½	7.05	6.75	7.40
WG	...	7.05	7.05	7.12½	6.95	7.70
WW	...	**7.60**	...	**7.60**	**7.45**	**8.50**
Rosins, Gum, Savannah (280 lb unit):**						
B	...	4.85	4.00	4.80	3.25	4.00
D	...	4.85	4.10	4.80	3.55	4.30
E	...	5.10	4.82½	5.15	3.80	5.00
F	...	5.40	4.90	5.45	4.00	5.35
G	...	5.45	5.10	5.50	4.40	5.70
H	...	5.50	5.27½	5.55	4.40	5.70
I	...	5.50	5.35	5.57½	4.40	5.80
K	...	5.50	5.45	5.60	4.40	5.80
M	...	5.52½	5.45	5.62½	4.40	5.85
N	...	5.52½	5.55	5.65	5.10	6.00
WG	...	5.75	5.65	5.75	5.60	6.30
WW	...	**6.20**	...	**6.20**	**5.60**	**7.10**
X	...	**6.20**	...	**6.20**	**6.05**	**7.10**
Rosin, Wood, c-l, FF grade, NY	4.60	6.95	4.60	6.95	5.35	6.80
Rotten Stone, bgs mines ton	25.50	**37.50**	25.50	**37.50**	**22.50**	**37.50**
Imported, lump, bbls...lb.	...	**.14**	...	**.14**	...	.14
Powdered, bbls .....lb.	.08½	.10	.08½	.10	.08½	.10
S						
Sago Flour, 150 lb bgs..lb.	.04	nom.	.04	.04½	.02½	.04½
Sal Soda, bbls wks...100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks .....ton	...	**17.00**	...	17.00	19.00	25.00
Chrome, c-l, wks .....ton	...	16.00	11.00	16.00	11.00	12.00
Saltpetre, gran, 450-500 lb bbls .....lb.	...	.071	...	.071	.06½	.069
Cryst, bbls .....lb.	...	.081	...	.081	.07½	.0865
Powd, bbls .....lb.	..	.081		.081	.07½	.079
Satin, White, pulp, 550 lb bbls .....lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs .....lb.	...	.46	.46	.48	.46	.48
Shellac, Bone dry, bbls..lb. *s*	.25	.26	.25	.26	.18	.26
Garnet, bgs .....lb.	.21	.22	.19	.23	.12½	.20
Superfine bgs .....lb. *s*	.15½	.19	.15½	.20½	.10	.21
T. N., bgs .....lb. *s*	.14½	.18	.14½	.19½	.09½	.20
Silver Nitrate, vials .....oz.	...	.26⅞	...	.26⅞	.26⅞	.33½
Slate Flour, bgs, wks....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	...	**1.10**	...	**1.10**	...	1.10
58% light, bgs .....100 lb.	1.05	1.08	1.05	1.08	...	1.08
blk .....100 lb.	...	**.90**	...	**.90**	...	.90
paper bgs .....100 lb.	...	1.05	...	1.05	...	1.05
bbls .....100 lbs.	...	1.35	...	1.35	...	1.35
Caustic, 76% grnd & flake, drs .....100 lb.	...	**2.70**	...	**2.70**	...	2.70
76% solid, drs .....100 lb.	...	**2.30**	...	**2.30**	2.10	2.30
Liquid sellers, tks...100 lb.	...	1.97½	...	1.97½	...	1.97½
Sodium Abietate, drs ....lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks .....lb.	.04	.05	.04	.05	.04	.05
anhyd, drs, delv .....lb.	.08½	.10	.08¼	.10	...	.08¼
Alginate, drs .....lb.	.71	.96	.71	.96	.70	.95
Antimoniate, bbls .....lb.	.14½	.15	.14½	.15	.11½	.16
Arsenate, drs .....lb.	.07	.08¾	.07	.08¾	.08	.08½
Arsenite, liq, drs ....gal.	...	.35	...	.35	.30	.35
Dry, gray, drs, wks..lb.	.06½	.09¼	.06½	.09½	.07½	.09½
Benzoate, USP kgs ...lb.	.46	.52	.46	.52	.46	.48
Bicarb, powd, 400 lb bbl, wks .....100 lb.	...	1.70	1.70	1.85	...	1.85
Bichromate, 500 lb cks, wks* .....lb.	.06⅞	.07¼	.06¾	.07¼	.06¾	.07¼
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.031	.036
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	1.40	1.80
Chlorate, bgs, wks .....lb.	.06¼	.08½	.06¼	.08½	.06¼	.07½
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv .....lb.	...	.09	...	.09	...	.09
Fluoride, white 90%, 300 lb bbls, wks .....lb.	.07½	.08	.07	.08	.07	.08¾
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.16	.17	.16	.17	.16	.17
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.		2.80	...	2.80	...	2.80
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	2.45	...	2.45	2.80	2.45	2.80
Iodide, jars .....lb.	...	2.30	...	2.30	...	2.30
Metal, drs, 280 lbs ....lb.	...	.19	...	.19	...	.19
Metanilate, 150 lb bbls..lb	.41	nom.	.41	.42	.41	.42
Metasilicate, gran, c-l, wks .....100 lb.	...	2.35	...	2.35	2.20	2.35
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	2.90	3.05
Monohydrated, bbls ...lb.	...	.023	...	.023	...	.023
Naphthenate, drs .....lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	.50	.54
Nitrate, 92% crude, 200 lb bgs, c-l, NY .....ton	...	28.30	...	28.30	...	28.30
	...	29.00	...	29.00	...	29.00
Bulk .....ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ....lb.	.06¾	.11½	.06¾	.11½	.06¾	.11½
Othochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l .....lb.	...	.03	...	.03	...	.03
Perborate, drs, 400 lb ..lb.	.14¾	.15¼	.14¾	.15¼	.14¾	.15¼
Peroxide, bbls, 400 lb ..lb.	...	**.17**	...	**.17**	...	**.17**

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c: Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case: t T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. *Spot price is ⅛c higher.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Sodium (continued):					
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	... 2.30	...	2.30	2.05	2.30
bgs, wks .....100 lb.	... 2.10	...	2.10	1.85	2.10
Tri-sodium, tech, 325 lb. bbls, wks .....100 lb.	... 2.45	...	2.45	2.20	2.45
bgs, wks .....100 lb.	... 2.25	...	2.25	2.00	2.25
Picramate, 160 lb kgs..lb.	... .65	.65	.67	.65	.67
Prussiate, Yellow, 350 lb. bbls, wks .....lb.	.09½ .09¾	.09½	.09¾	.09½	.10¾
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	... .0530	...	.0530	...	.0530
Sesquisilicate, drs, c-l, wks .....100 lb.	... 2.90	...	2.90	2.80	2.90
Silicate, 60°, 55 gal drs, wks .....100 lb.	1.40 1.80	1.40	1.80	1.65	1.70
40°, 55 gal drs, wks 100 lb	... .80	...	.80	...	.80
tks, wks .....100 lb.	... .65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY .....lb.	no prices		no prices	.03½	.04¾
Stannate, 100 lb drs ...lb.	no prices		no prices	.30	.35
Stearate, bbls .....lb.	.19 .24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16 .18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks .....100 lb. †	1.45 1.90	1.45	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, wks .....lb.	.02¼ .03	.02¼	.03	.02¼	.02½
Solid, 650 lb drs, c-l, wks .....lb.	.03 .03¾	.03	.03¾	.03	.03½
Sulfite, cryst, 400 lb bbls, wks .....lb.	.023 .02½	.023	.02½	.023	.02½
Sulfocyanide, drs .....lb.	.28 .47	.28	.47	.28	.47
Sulforicinoleate, bbls....lb.	... .12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)					
Tungstate, tech, crys, kgs lb.	no prices		no prices	1.05	1.10
Sorbitol, com, solut, wks c-l, drs, wks .....lb.	.15½ .16	.15½	.16	...	.15½
Spruce, Extract, ord, tks..lb.	... .01⅛	...	.01⅛	...	.01⅛
Ordinary, bbls .....lb.	... .01⅜	...	.01⅜	...	.01⅜
Super spruce ext, tks...lb.	... .01⅜	...	.01⅜	...	.01⅜
Super spruce ext, bbls..lb.	... .01⅞	...	.01⅞	...	.01⅞
Super spruce ext. powd, bgs .....lb.	... .04	...	.04	...	.04
Starch, Pearl,140 lb bgs100 lb.	... 2.70	2.50	2.70	2.40	2.85
Powd, 140 lb bgs ...100 lb.	... 2.80	2.60	2.80	2.50	2.90
Potato, 200 lb bgs .....lb.	.05 .0565	.05	.06¼	.04	.06¾
Imp, bgs .....lb.	... .06½	...	.06½	.05	.06½
Rice, 200 lb bbls .....lb.	... .07¼	...	.07¼	.06¼	.07¼
Sweet Potato, 240 lb bbls, f.o.b. plant .....100 lb.	... 6.00	5.50	6.00	5.50	7.50
Wheat, thick, bgs .....lb.	... .05½	...	.05½	.05	.05½
Strontium, carbonate, 600 lb bbls, wks .....lb.	... .23	.22	.23	.16	.24
Nitrate, 600 lb bbls, NY lb.	.07¾ .08¾	.07¾	.08¾	.07¾	.08¼
Sucrose, octa-acetate, den, grd, bbls, wks .....lb.	... .45	...	.45	...	.45
tech, bbls, wks .....lb.	... .40	...	.40	...	.40
Sulfur, crude, f.o.b. mines ton	... 16.00	...	16.00	...	16.00
Flour, com'l, bgs ...100 lb.	1.60 1.95	1.60	2.35	1.65	2.35
bbls .....100 lb.	1.95 2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs..100 lb.	... 2.00	2.00	2.80	2.20	2.80
bbls .....100 lb.	... 2.35	2.35	3.15	2.55	3.15
Extra fine, bgs .....100 lb.	... 2.85	2.85	3.00	2.85	3.00
Superfine, bgs .....100 lb.	2.65 2.80	2.65	2.80	2.65	2.80
bbls .....100 lb.	2.25 3.10	2.25	3.10	2.25	3.10
Flowers, bgs .....100 lb.	3.00 3.75	3.00	3.75	3.00	3.75
bbls .....100 lb.	3.35 4.10	3.35	4.10	3.35	4.10
Roll, bgs .....100 lb.	2.35 2.70	2.35	3.10	2.35	3.10
bbls .....100 lb.	2.85 3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, 700 lb drs, wks .....lb.	.03 .08	.03	.08	.03	.04
Sulfur Dioxide, 150 lb cyl lb.	.07 .09	.07	.09	.07	.09
Multiple units, wks ....lb.	.04½ .07	.04½	.07	.04½	.07
tks, wks .....lb.	.04 .06	.04	.06	.04	.05
Refrigeration, cyl, wks lb.	.16 .17	.16	.17	.16	.17
Multiple units, wks ...lb.	.07½ .10	.07½	.10	.07½	.10
Sulfuryl Chloride .....lb.	.15 .40	.15	.40	.15	.40
Sumac, Italian, grd .....ton	... 140.00	98.00	140.00	65.50	85.00
Extract, 42°, bbls .....lb.	.06 .06¼	.06	.06¼	.05¼	.06¼
Superphosphate, 16% bulk, wks .....ton	... 9.00	...	9.00	8.00	9.00
Run of pile .....ton	... 8.50	...	8.50	7.50	8.50
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit .....ton	... .70	...	.70	...	.70
T					
Talc, Crude, 100 lb bgs, NY ton	14.00 15.00	14.00	15.00	13.00	15.00
Ref'd 100 lb bgs, NY ton	14.00 16.00	14.00	16.00	14.00	16.00
French, 220 lb bgs, NY ton	23.00 35.00	23.00	35.00	23.00	30.00
Ref'd, white bgs, NY ton	45.00 60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	64.00 67.00	64.00	70.00	60.00	70.00
Ref'd', white bgs, NY ton	67.00 78.00	65.00	78.00	65.00	70.00
Tankage, Grd, NY ...unit ‖	... 3.10	3.10	3.25	2.75	3.25
Ungrd .....unit ‖	... 3.10	3.10	3.25	2.75	5.00
Fert grade, f.o.b.Chgounit ‖	... 3.35	3.35	3.50	2.50	4.50
South American cif unit ‖	... 3.35	3.35	3.50	3.00	4.00
Tapioca Flour, high grade, bgs .....lb.	.02¾ .04½	.02¾	.04½	.01¾	.05½
Tar Acid Oil, 15%, drs..gal.	.22 .24	.22	.24	.21	.24
25% drs .....gal.	.26 .28	.26	.28	.25	.28
Tar, pine, delv, drs.....gal.	.26 .27	.26	.27	.25	.27
tks, delv, E. cities ....gal.	... .21	...	.21	.20	.21
Tartar Emetic, tech, bbls lb.	.34¾ nom.	.34¾	.35	.27¾	.35
USP, bbls .....lb.	.40 nom.	...	.40	.33	.40
Terpineol, den grade, drs lb.	... .17	...	.17	...	.17
Tetrachlorethane, 650 lb drs lb.	.08 .08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech lb.	.08 .09½	.08	.09½	...	.09½
Tetralene 50 gal drs, wks lb.	... .12	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbls lb.	... .24	.20	.25	.20	.25

† Bags 15c lower; ‖ + 10.

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Tin
Zein

Prices

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Tin, crystals, 500 lb bbls, wks lb.	...	.36	.36	.37	.35½	.39
Metal, NY .....lb.	...	.45½	.45½	.47½	.45½	.60
Oxide, 300 lb bbls, wks lb.	.51	.53	.51	.53	.50	.54
Tetrachloride, 100 lb drs, wks .....lb.	...	.22½	.23	.24¾	.23	.32
Titanium Dioxide, 300 lb bbls lb.	.13	.16	.13	16	.13¼	.16
Barium Pigment, bbls ..lb.	.05¼	.06½	.05¼	.06½	.05⅜	.06½
Calcium Pigment, bbls lb.	.05	.06¼	.05	.06¼	.05⅜	.06½
Titanium tetrachloride, drs. f.o.b. Niagara Falls ....lb.	.32	.45	.32	45	.32	.45
Titanium trichloride 23% sol. bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls ....lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks .....lb.	..	.26	.26	.27	.26	.27
Toluol, 110 gal drs, wks gal.	...	.30	.27	.30	...	.27
8000 gal tks, frt all'd gal.	...	.25	.22	.25	...	.22
Toner Lithol, red, bbls..lb.	.55	.60	.55	.60	.55	.80
Para, red, bbls .....lb.	.70	.75	.70	.75	.70	.80
Toluidine, bgs .....lb.	...	1.05	1.05	1.35	...	1.35
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl,drs,wks lb.	...	.27	...	.27	...	.27
Triamylamine, c-l, drs, wks lb.	...	.77	...	.77	.77	1.25
lcl, wks, drs .....lb.	.78	.80	.78	.80	...	...
tks, wks .....lb.	...	.75	...	.75	...	...
Tributylamine, lcl, drs, wks lb.	.68	.70	.68	.70	...	.70
c-l, drs, wks .....lb.	...	.67	...	.67	...	...
tks, wks .....lb.	...	.65	...	.65	...	...
Tributyl citrate,drs,frt all'd lb.	...	.35	...	.35	.35	.45
Tributyl Phosphate, frt all'd lb.	...	.42	...	.42	...	.42
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	.08	.09	.08	.09	.08	.09½
Tricresyl phosphate,tech,drs, lb.	.22	.36½	.22	.36½	.22	.37½
Triethanolamine, 50 gal drs wks .....lb.	...	.19	.19	.22	.21	.22
tks, wks .....lb.	...	.18	.18	.20	...	.20
Triethylamine, lcl, drs, f.o.b. wks .....lb.	...	1.05	...	1.05	...	...
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls .....lb.	...	.30	...	.30	...	.30
Stearate bbls .....lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest .....lb.	...	.50	...	.50	...	.50
Trimethylamine, c-l, drs, frt all'd E. Mississippi ....lb.	...	1.00	...	1.00	...	1.00
Triphenylguanidine, ...lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs..lb.	...	.38	...	.38	...	.38
Trinoli, airfloated, bgs, wks ton	...	26.00	26.00	30.00	26.00	30.00
Turpentine (Spirits), c-l, NY dock, bbls .....gal.	...	.37**	.33¾	.40	.29	.35
Savannah, bbls .....gal.	...	.31*	.27¾	.34	.23½	.29
Jacksonville, bbls .....gal.	no prices		.26	.34¾	.23½	.26¾
Wood Steam dist, drs, c-l, NY .....gal.	...	.31	.31	.34½	.242	.34
Wood, dest dist, c-l, drs, delv E. cities .....gal.	.29	.31	.23	.31	.22	.25
U						
Urea, pure 112 lb cases..lb.	...	.13	.13	.15½	.14½	.15½
Fert grade, bgs, c. i. f. S.A. points .....ton	95.00	101.00	95.00	110.00	95.00	110.00
Dom f.o.b., wks .....ton	95.00	101.00	95.00	101.00	95.00	101.00
Urea Ammonia, liq., nitrogen basis .....ton	...	121.58	...	121.58	...	...
V						
Valonia beard, 42%, tannin bgs .....ton	....	47.00	47.00	54.00	45.00	57.00
Cups, 32% tannin bgs..ton	35.00	37.00	33.00	38.00	27.00	39.00
Extract, powd, 63% ....lb.	.0565 nom.		.0565	.06	.05	.06
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots ....lb.	...	2.60	...	2.60	2.20	2.60
Ex-guaiacol .....lb.	...	2.50	...	2.50	2.10	2.50
Ex-lignin .....lb.	...	2.50	...	2.50	2.10	2.50
Vermilion, English, kgs...lb.	no prices		...	2.76	1.50	2.97
W						
Wattle Bark, bgs .....ton	36.50	37.75	36.50	38.75	34.50	40.00
Extract, 60°, tks, bbls..lb.	...	.04¼	...	.04¼	.04	.05½
Wax, Bayberry, bgs .....lb.	.25	.26	.25	.30	.16⅞	.39
Bees, bleached, white 500 lb slabs, cases .....lb.	...	.38	...	.38	.33	.40½
Yellow, African, bgs..lb.	.26½	.27	.26½	.28	.18½	.30
Brazilian, bgs .....lb.	.26	.26½	.26	.29	.21	.33
Refined, 500 lb slabs, cases lb.	.31	.36	.31	.36	.25½	.36
Candelilla, bgs .....lb.	.18	.18½	.18	.19	.15¼	.19
Carnauba, No. 1, yellow, bgs .....lb.	.75	.76	.69	.76	.36¾	.78
No. 2, yellow, bgs...lb.	.73	.74	.68	.74	.35¾	.45
No. 2, N. C., bgs ...lb.	.56	.57	.46	.57	.34	.41
No. 3, Chalky, bgs ...lb.	.51½	.52	.43	.52	.27½	.46
No. 3, N. C., bgs ...lb.	.53	.53½	.47	.53½	.28¾	.49
Ceresin, dom, bgs .....lb.	.11½	.12	.11½	.15	.08½	.15
Japan, 224 lb cases ....lb.	.15½	.16	.15½	.16½	.09¾	.18
Montan, crude, bgs ....lb.	no prices		no prices		.11	.11¼
Paraffin, see Paraffin Wax, Spermaceti, blocks, cases lb.	.23	.24	.23	.25	.18	.25
Cakes, cases .....lb.	.24	.25	.24	.25	.19	.26
Whiting, chalk, com 200 lb bgs, c-l, wks .....ton	16.00	20.00	12.00	20.00	12.00	14.00
Gilders, bgs, c-l, wks..ton	17.00	18.50	15.00	18.50	...	15.00
Wood Flour, c-l, bgs ....ton	...	25.00	20.00	30.00	20.00	30.00
Xylol, frt all'd, East 10° tks, wks .....gal.	...	.30	...	.30	.29	.30
Com'l tks, wks, frt all'd, gal	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Zein, bgs, 1000 lb lots, wks .....lb.	...	.20	...	.20	...	...

* Mar. 29. **Mar. 29.

		Current Market		1940 Low	1940 High	1939 Low	1939 High
Zinc Acetate, tech, bbls, lcl, delv	lb.	.15	.16	.15	.16	.15	.21
Arsenite, bgs, frt all'd	lb.	...	.12	.12	.12½	.12	.13
Carbonate tech, bbls, NY	lb.	.14	.16	.14	.16	.14	.15
Chloride fused, 600 lb drs, wks	lb.	...	.04¾	.04¼	.046	.04¼	.046
Gran, 500 lb drs, wks	lb.	...	.05	.05	.05¾	.05	.05¾
Soln 50%, tks, wks 100 lb.		...	2.25	...	2.25	...	2.25
Cyanide, 100 lb drs	lb.	...	.33	...	.33	...	.33
Dust, 500 lb bbls, c-l, delv	lb.	...	.07¾	.07½	.07¾	.06½	.08½
Metal, high grade slabs, c-l, NY	100 lb.	...	6.14	5.90	6.14	4.84	6.40
E. St. Louis	100 lb.	...	5.75	4.60	5.75	4.60	6.00
Oxide, Amer, bgs, wks	lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
French 300 lb bbls, wks	lb.	.06½	.07¾	.06½	.07¾	.06½	.07¾
Palmitate, bbls	lb.	.24½	.27½	.23	.27½	.23	.25
Resinate, fused, pale bbls	lb.	...	.10	...	.10	...	.10
Stearate, 50 lb bbls	lb.	...	.23	.21½	.24½	.20	.24½
Sulfate, crys, 400 lb. bbls wks	lb.	...	.029	...	.029	...	.029
Flake, bbls	lb.	...	.0325	...	.0325	...	.0325
Sulfide, 500 lb bbls, delv	lb.	...	.07¾	.07¾	.08	.07¾	.08⅞
bgs, delv	lb.	...	.07½	.07½	.07¾	.07½	.08⅝
Sulfocarbolate, 100 lb kgs	lb.	.24	.26	.24	.26	.24	.26
Zirconium Oxide, crude, 73-75% grd, bbls, wks	ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

Babassu, tks, futures	lb.	...	.06⅛	.06⅛	.06⅝	.05⅞	.07⅝
Castor, No. 3, 400 lb drs	lb.	...	.12¾	...	.12¾	.08¼	.12¼
Blown, 400 lb drs	lb.	...	.14¾	...	.14¾	.10¼	.14¾
China Wood, drs, spot NY	lb.	.26	.26½	.26	.28	.15	.28
Tks, spot NY	lb.	.25	.26	.25	.27	.14½	.27
Coconut, edible, drs NY	lb.	.08⅝	...	.08⅝	.09⅜	.08⅛	.10⅛
Manila, tks, NY	lb.	.03	.03⅛	.03	.03¼	.02⅞	.04⅝
Tks, Pacific Coast	lb.	.02⅝	.02¾	.02⅝	.03⅛	.02⅝	.04⅛
Cod, Newfoundland, 50 gal bbls	gal.	.65	nom.	.65	.72	.29	.72
Copra, bgs, NY	lb.	...	.0165	.0165	.0185	.0160	.2625
Corn, crude, tks, mills	lb.	.06¼	.06¾	.06⅛	.06¾	.05⅛	.07⅛
Refd, 375 lb bbls, NY	lb.	.08⅝	.08⅞	.08⅛	.08⅞	.07½	.09¾
Degras, American, 50 gal bbls NY	lb.	.09	.10	.09	.10	.07	.10
English, bbls	lb.	.09	.10	.09	.10	.07	.10
Greases, Yellow	lb.	.04⅝	.04¾	.04⅝	.05¼	.03⅞	.06¾
White, choice, bbls, NY	lb.	.05⅛	.05¼	.05⅛	.05⅝	.04½	.07½
Lard, Oil, edible, prime	lb.	...	.09¼	.09¼	.10	.09	.11¼
Extra, bbls	lb.	...	.08¾	.08¾	.09⅜	.08	.10⅜
Extra, No. 1, bbls	lb.	...	.08¼	.08¼	.08⅞	.07¾	.10⅛
Linseed, Raw less than 5 bbl lots	lb.	...	.116	.110	.116	.092	.119
bbls, c-l, spot	lb.	.108	.110	.102	.110	.084	.111
Tks	lb.	.102	.104	.096	.104	.078	.104
Menhaden, tks, Baltimore	gal.	.34	nom.	.34	.35	.21	.35
Refined, alkali, drs	lb.	...	.081	.071	.081	.062	.082
Tks	lb.	...	.069	...	.069	.056	.076
Kettle boiled, drs	lb.	...	.093	...	.093	.074	.094
Light pressed, drs	lb.	...	.075	...	.075	.056	.076
Tks	lb.	...	.069	...	.069	.067	.069
Neatsfoot, CT, 20°, bbls, NY	lb.	...	.17½	.17½	.19¼	.14¾	.19¾
Extra, bbls, NY	lb.	...	.08¼	.08¼	.09	.08	.10⅛
Pure, bbls, NY	lb.	...	.13¼	.13¼	.14¼	.10¾	.16¾
Oiticica, bbls	lb.	.19	.20	.19	.21	.09¼	.21
Oleo, No. 1, bbls, NY	lb.	...	.07¼	.07¼	.07¾	.07¼	.12
No. 2, bbls, NY	lb.	...	.08	.07	.07½	.06¾	.11¾
Olive, denat, bbls, NY	gal.	.94	.95	.94	.98	.82	1.40
Edible, bbls, NY	gal.	1.85	1.95	1.85	2.00	1.75	2.25
Foots, bbls, NY	lb.	...	.08⅜	.08	.08½	.06¾	.10
Palm, Kernel, bulk	lb.	no prices		no prices		.034	.036
Niger, cks	lb.	.04⅜	.05½	.04⅜	.05½	.03⅝	.05½
Sumatra, tks	lb.	.03	nom.	.03	nom.	.0265	.02¾
Peanut, crude, bbls, NY	lb.	.07¼	.07⅜	.06¾	.07⅜	.06	.08
Tks, f.o.b. mill	lb.	.06½	nom.	.06½	.07⅛	.05¼	.07¼
Refined, bbls, NY	lb.	.09⅜	.09⅝	.09⅜	.09¾	.08¾	.10¾
Perilla, drs, NY	lb.	.21	nom.	.19	.21	.09½	.16½
Tks, Coast	lb.	20	nom.	.18½	.20	.089	.15¾
Pine, see Pine Oil, Chem. Sec.							
Rapeseed, blown, bbls, NY	lb.	.17	.17½	.17	.17½	.14	.17½
Denatured, drs, NY	gal.	1.00	1.05	1.00	1.05	.80	1.05
Red, Distilled, bbls	lb.	.08	.09	.08	.09½	.06¾	.09½
Tks	lb.	...	.07½	.07½	.08	.064	.08½
Sardine, Pac Coast, tks	gal.	.37	nom.	.37	.39	.24	.38
Refined alkali, drs	lb.	...	.081	...	.081	.062	.082
Tks	lb.	...	.075	...	.075	.056	.076
Light pressed, drs	lb.	...	.075	...	.075	.056	.076
Tks	lb.	...	.069	...	.069	.05	.07
Sesame, white, dom	lb.	.11½	.11¾	.11½	.11¾	.09	.12
Soy Bean, crude							
Dom, tks, f.o.b. mills	lb.	.06	nom.	.06	.06¼	.04½	.06½
Crude, drs, NY	lb.	.06¾	.07⅛	.06⅝	.07¾	.05⅛	.07⅝
Ref'd, drs, NY	lb.	.07¾	.08½	.08	.08½	.06⅜	.09
Tks	lb.	.07	.07½	.07	.07⅝	.05¾	.07¾
Sperm, 38° CT, bleached bbls, NY	lb.	...	.103	...	.103	.09	.103
45° CT, blchd, bbls, NY	lb.	...	.096	...	.096	.083	.096
Stearic Acid, double pressed dist bgs	lb.	.11¼	.12¼	.11¼	.13	.10	.13½
Double pressed saponified bgs	lb.	.11½	.12½	.11½	.13¾	.10¼	.13¾
Triple pressed dist bgs	lb.	.14¼	.15½	.14¼	.16½	.12¾	.16½
Stearine, Oleo, bbls	lb.	.06	.06¼	.06	.06½	.05½	.12
Tallow City, extra loose	lb.	...	.04¾	.04¾	.05⅜	.04⅜	.07
Edible, tierces	lb.	...	.05⅛	.05⅛	.05¾	.04½	.07¾
Acidless, tks, NY	lb.	...	.07½	.07½	.08	.07	.09¼
Turkey Red, single, drs	lb.	...	.082	.082	.09	.06	.08⅝
Double, bbls	lb.	...	.11	.11	.12¾	.08¾	.11¼
Whale:							
Winter bleach, bbls, NY	lb.	...	095	...	.095	.075	.095
Refined, nat, bbls, NY	lb.	...	.091	...	.091	.071	.091

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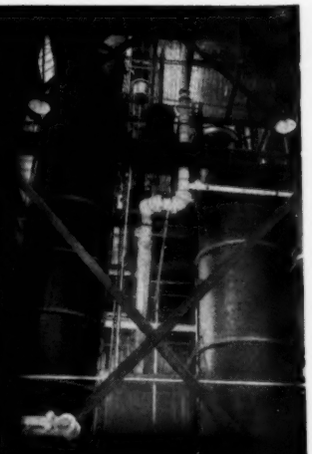

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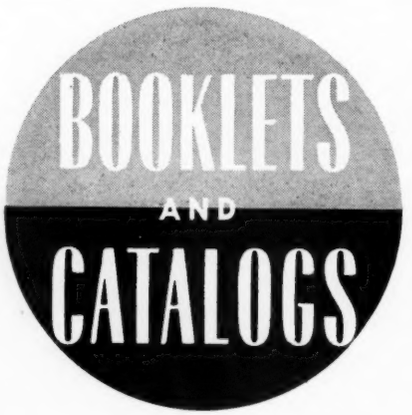

Chemicals

A154. By Gum; March, 1940. Articles on synthetic porcelain-like coatings for metals. Toxicity of chemical color pigments, and C.P. organic colors. Also gives several formulas for enamels, lacquers and primers. Reichhold Chemicals, Inc.

A155. Catalog of C.P. chemicals and acids, and other laboratory and technical chemicals. J. T. Baker Chemical Co.

A156. Ciba Review; March, 1940. A comprehensive story of "Textile Printing in 18th Century France."

A157. Circular 113; A 14-page booklet containing an article by J. E. Greaves on "The Minerals of Wheat and Their Relationship to Human and Animal Nutrition." Utah State Agricultural College.

A158. Cubor; Pamphlet describing uses and properties of "cubor," a plant insecticide. Chipman Chemical Co.

A159. Dow Special Products; First Edition, March, 1939. Due to extensive research a large number of products have been developed. Of these, 156 have been selected for listing in this catalog as being typical and at the same time showing promise of commercial development. Structural formulas and chemical and physical properties are given for each. The Dow Chemical Co.

A160. Durez Molder; March, 1940. Article on "Elasticity of Phenolics." Illustrated new uses of plastics, and other short items.

A161. Durez Plastic News. February, 1940. Descriptions and illustrations of new articles made from plastics. Durez Plastics and Chemicals, Inc.

A162. Hercules Mixer; Feb., 1940. Article on wall-papers and company news. The Hercules Powder Co.

A163. Lead; March, 1940. 12-page booklet of illustrated articles on various uses of lead and white lead paint.

A164. Liquo & Indusoil; Describes the production, composition, chemistry and uses of these two new fatty acids from pine wood. Industrial Chemical Sales.

A165. Monsanto Magazine; Feb., 1940. In this issue "Confidence Creates Employment" by Gaston DuBois, "Scuttling Research" by Robert L. Sibley, and other items.

A166. Price list and catalog of essential oils, balsams, aromatic chemicals, oleoresins, certified colors, flavoring materials, basic perfuming products. Magnus, Mabee & Reynard, Inc.

A167. Set of five papers describing the story behind the production and sale of five different water-soluble gums. The sheets have been perforated so that they can be added to loose leaf book. Innis, Speiden & Co.

A168. Solvent Recovery by the "Columbia" Activated Carbon System; The purpose of this booklet is to supply general information about this system of solvent recovery and to indicate where it can be profitably employed. Carbide and Carbon Chemicals Corp.

Equipment—Containers

E227. Aluminum News Letter; Feb., 1940. Contains illustrated article on the all-aluminum "Eagles" built for Missouri Pacific Lines by the Saint Charles works of the American Car and Foundry Co. Also other brief items. Aluminum Company of America.

E228. Annual Review of Sales and Engineering Developments; Discussion of the developments and improvements in Allis-Chalmers products during 1939 and indicated trends for 1940. Allis-Chalmers Mfg. Co.

E229. Are You Shipping Box Conscious; Pamphlet explaining the advantages attractive, modern shipping boxes and description of H&D facilities. The Hinde & Dauch Paper Co.

E230. Booklet describing balanced-angle two-cylinder air compressor. Worthington Pump and Machinery Corp.

E231. Booklets giving information and illustrations of new G. E. equipment—G. E. Reactrol System, A-c Magnetic Motor-Starting Switch, and Capacitor Motors. General Electric Co.

E232. Brown Mechanical Flow Meters; Catalog covering the complete line of mechanical flow meters—indicators, recorders, and air-operated flow controllers—now furnished in the modern rectangular case, styled by Henry Dreyfuss. The Brown Instrument Co.

E233. Design 32 Cross-Drum Boiler; 16-page bulletin describing this straight-tube, sectional-header unit of moderate cost, for pressures of 250 lbs./sq. in. or less; and with heating surface from 1000 to 6000 sq. ft. Babcock & Wilcox Co.

E234. Double Interlock Roller Bearing; 18-page booklet announcing this new type roller bearing. Contains diagrams, illustrations, and specifications. Dodge Manufacturing Corp.

E235. Fourth General Report, 1939; Supplies information on the work done by the International Tin Research and Development Council.

E236. High Pressure Autoclaves; Illustrated catalog describing laboratory and semi-plant size autoclaves, made in all metals and alloys and built to stand pressures up to 25,000 lbs./sq. in. Struthers-Wells.

E237. Increase Production Without Plant Expansion; Folder describing the use of Brown Meters in increasing the present boiler room capacity with existing equipment. The Brown Instrument Co.

E238. Lightnin Mixers; Complete catalog, 16 well illustrated pages containing information on nozzle mounting top entering mixers. Mixing Equipment Co., Inc.

E239. Monel, Nickel and Inconel in Soap and Related Products Industries; The International Nickel Co., Inc.

E240. New catalog, No. 12, of 32 pages illustrates and describes the entire line of Hartzell propeller-type fans and blowers, and gives complete air-delivery tables on each of them. Hartzell Propeller Fan Co.

E241. Nickel-Clad Steel; Catalog describing and illustrating some properties and uses of nickel-clad steel. Also contains chart listing industries and applications where this type of steel is used. Lukens Steel Co.

E242. Nickel Cast Iron News; Illustrated uses and descriptions of products of cast irons. International Nickel Co.

E243. Oxy-Acetylene Tips; March, 1940. In this issue—"How to Cut Chromium Steel Castings," "High Speed Removal of Abandoned Street Car Tracks," "Safe-Ending Drills and Chisels." The Linde Air Products Co.

E244. Process Industries Quarterly; Features "Combating Corrosion in the Corn Products Industry." Also describes and illustrates an experimental tower packed with nickel mesh. The International Nickel Co.

E245. R-C Auto-Flo; Describes and illustrates modern water system for farm and home. Roots-Connersville Blower Corp.

E246. Sample Kit; The purpose of this collection of typical packaging material in book form is to demonstrate the many variations possible in developing a container to suit exact requirements. To supplement the actual materials exhibited there is also a reasonably complete listing of material suppliers. The list of manufacturers includes those who have contributed samples for this book, as well as many other suppliers of caps, bottles, labels, cartons, wrappers, etc. Pneumatic Scale Corp.

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"We"—Editorially Speaking

I. D. HAGAR

I. D. Hagar, Titanium Pigment Division of National Lead, and author of "The Titanium Pigments" (page 438), is a Vermont product, born at Weybridge on January 6, 1886. He is an alumnus of Middlebury College and did graduate work at Syracuse University. He started his business career in Mexico with Cementos Hidalgo, joined the Union Pacific as a chemist in 1911, switched to Mound City Paint & Color Co., 1912-'18. Mr. Hagar was a production engineer with Devoe & Raynolds for two years before joining the staff of Titanium Pigment Co. in 1921 as a sales engineer. He was made eastern sales manager in '30 and general sales manager and a director of the company in 1936. He has been greatly instrumental in the remarkable development in the use of titanium pigments in many processing fields.

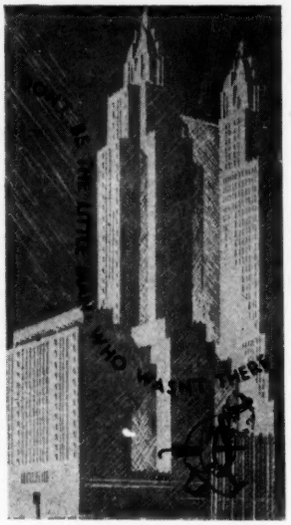
The May issue will have several features that you will not want to miss. In the "Creating Industries" series John Morris Weiss, president of the well-known consulting firm of Weiss & Downs, will review the developments in intermediates during the past twenty years; Dr. Charles E. Mullin, former professor of textile chemistry at Clemson College and now a consultant at Huntingdon, Pa., will discuss waterproofing textiles. This will be the first in a series of articles by him dealing with such important topics as "Flameproofing" and "Shrinkproofing" of textiles. Albert H. Hooker, Jr., will point out to chemical executives just what will be expected of them in the event of war in his article, "The Mobilization of Industry." Major Hooker was one of the 51 reserve officers who attended the Army Industrial College for instruction in Procurement Planning, November 12-25, 1939, at Washington. He has been intimately connected with military affairs since 1917. His decorations include the Silver Star, the Purple Heart, and the Conspicuous Service Cross.

JOHN MORRIS WEISS

Manufacturers of specialties will find in the May issue a companion article to "What Specialties Do the Chains Buy," appearing in this number entitled, "How To Sell The Chains." We would like to have your frank reactions to merchandising articles of this type.

❖❖❖❖

Once again "We" award the palm to the Westvaco-Warner Chemical crowd for the most attractive invitation "to go up stairs" at a recent dinner of the Drug, Chemical and Allied Sections of the New York Board of Trade. From personal observation there were very few who weren't there at sometime or other during the evening—or should we have said morning?



❖❖❖❖

Speaking of the dinner, the first 35 minutes of Senator Nye's speech were exceptionally well received. Don't blame "Doc" Dorland, chairman of the dinner, for the balance. He certainly made it very plain that 35 minutes were just about all anybody wanted.

❖❖❖❖

If you didn't taste Commercial Solvents' Virginia ham you missed one of the best "port-of-calls" on the Waldorf itinerary.

❖❖❖❖

"We" wish to thank all those who either by their attendance or by their written or telegraphed expressions of congratulation participated in the "surprise" dinner at the Chemists' Club on March 20, particularly the committee of conspirators which, we believe, included Dr. C. R. Downs, Dr. Benjamin T. Brooks, "Ed" Schmidt, and E. L. Luaces. "We" deeply appreciate the compliment paid to the paper and by the presence of so many there, and specially want to thank Dr. Walter S. Landis for his informal discussion of the importance in the industrial life of the nation, of trade and business papers generally. "We" owe a lot of lunches—the line forms on the left. And, in conclusion, "We" wish to categorically deny the rumor that there was any connection between an alleged "cut" on the dinner receipts and the recent inspection of the chemical industry of Bermuda.

Fifteen Years Ago

From our files of April, 1925

Chemical Foundation officials freed of conspiracy charge and President Wilson's executive order for sale of German patents upheld.

Major General Amos A. Fries, Chief of the Chemical Warfare Service spoke before the Salesmen's Association of the American Industry in New York. He stressed the idea that American chemical manufacturers should do everything within their power to impress upon the American people the necessity of a strong chemical industry.

O. L. Biebinger, for thirty-seven years actively connected with the business of the Mallinckrodt Chemical Works, was elected President of the company at a recent meeting of the Board of Directors. Edward Mallinckrodt, Sr., remains as Chairman of the Board of Directors.

The relation of the acetic acid market to unsettled conditions in the American wood chemical industry, focuses attention on the possibilities of synthetic acid. In Canada a plant is producing 12,000 tons of glacial acetic acid per year by synthesis from acetylene. Every likelihood exists that synthetic production will be started in the United States.

4/18/40

State of Chemical Trade

Current Statistics (March 31, 1940)—p. 55

WEEKLY STATISTICS OF BUSINESS

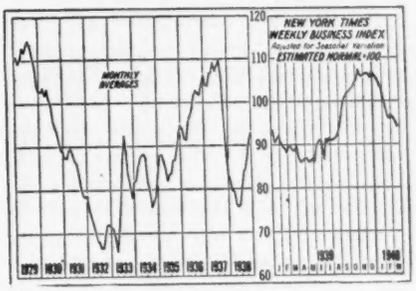
Week Ending	Carloadings 1940	Carloadings 1939	Carloadings % of Change	Electrical Output* 1940	Electrical Output* 1939	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Fert. Mat.	Price Indices Mixed Fert.	Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Mar. 2	634,410	594,424	+ 6.7	2,479,036	2,244,014	+10.5	80.7	94.3	52.2	73.3	78.7	77.1	77.8	64.6	96.8	84.4
Mar. 9	620,997	588,426	+ 5.5	2,463,999	2,237,935	+10.1	80.4	94.3	53.0	73.3	78.7	76.8	77.5	64.7	96.0	84.2
Mar. 16	618,985	591,166	+ 4.7	2,460,317	2,225,486	+10.6	79.6	94.3	51.9	73.0	78.4	76.4	77.4	62.4	95.0	84.3
Mar. 23	619,886	601,948	+ 3.0	2,424,350	2,198,681	+10.3	79.9	94.3	50.7	72.9	78.4	76.4	77.3	60.7	94.1	84.1

* K.W.H. 000 omitted; † 1926-1928 = 100.00.

MONTHLY STATISTICS

CHEMICAL:	Feb. 1940	Feb. 1939	Jan. 1940	Jan. 1939	Dec. 1939	Dec. 1938
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	.....	169,769	235,023	181,386	219,838	176,823
Consumpt. in mfr. fert.	.....	138,273	182,160	142,451	172,332	148,289
Stocks end of month	.....	92,163	92,040	92,850	83,814	90,089
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal.	20,381,272	14,650,062	20,655,547	17,067,004	22,080,109	16,780,614
Comp. denat. prod., wine gal.	453,848	339,343	1,303,991	474,140	655,916	2,105,460
Removed, wine gal.	412,653	361,310	1,318,113	444,784	675,899	2,109,668
Stocks end of mo., wine gal.	327,350	432,644	287,163	455,271	304,976	426,639
Spec. denat. prod., wine gal.	8,005,829	6,106,587	9,063,786	6,352,405	10,502,486	8,372,981
Removed, wine gal.	8,092,437	6,197,035	8,828,451	6,276,747	10,758,595	8,323,920
Stocks end of mo., wine gal.	1,038,272	827,846	1,129,653	923,449	868,494	851,887
Ammonia sulfate prod., tons *a*	53,884	41,780	60,393	45,756.5	60,454.5	45,837
Benzol prod., gal. *b*	9,695,000	7,141,000	11,424,000	7,788,000	11,536,000	7,802,000
Byproduct coke, prod., tons *a*	4,016,742	3,077,854	4,707,068	3,366,956	4,718,197	3,362,845
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	723,107	712,212	878,316	641,575	750,269	543,797
Sheets, ship., lbs.	594,261	698,393	749,002	685,139	830,164	674,069
Rods, prod., lbs.	246,298	267,790	291,806	233,530	283,258	187,926
Rods, ship., lbs.	257,399	230,625	275,316	220,464	298,140	201,074
Tubes, prod., lbs.	46,797	69,293	68,702	48,284	55,358	57,695
Tubes, ship., lbs.	66,739	48,273	58,805	50,809	70,356	61,942
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	636,834	988,719	857,277	896,122	987,017	1,111,639
Shipments, lbs.	655,076	1,014,295	751,429	855,778	1,029,572	1,031,652
Molding comp., ship.; lbs.	877,685	770,006	1,023,808	682,482	1,135,205	671,160
Methanol (Bureau of the Census)						
Production, crude, gals.	446,815	336,157	457,271	351,814	434,021	357,249
Production, synthetic, gals.	3,782,402	2,267,339	3,452,677	2,462,884	4,184,479	2,844,249
Pyrozylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds.	.....	3,005,939	2,909,785	2,637,337	2,867,168	2,711,664
Heavy goods, ship., linear yds.	.....	2,113,036	2,151,034	2,147,444	2,280,890	1,839,537
Pyroxylin spreads, lbs. *c*	.....	5,079,315	2,131,394	5,270,462	5,038,160	8,692,244
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*	$19,436	$11,958	$20,432	$8,984	$23,102	$13,525
Crude sulfur *d*	$849	$575	$1,001	$555	$1,139	$666
Coal-tar chemicals *d*	$2,421	$877	$2,895	$1,015	$1,802	$1,032
Industrial chemicals *d*	$4,727	$1,799	$4,189	$1,770	$5,047	$2,065
Imports						
Chemicals and related prod. *d*	.....	$6,099	.....	$6,742	$6,762	$6,729
Coal-tar chemicals *d*	$419	$1,794	$1,182	$1,817	$1,307	$1,188
Industrial chemicals *d*	$1,136	$1,146	$1,408	$1,120	$1,556	$1,293
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	121.0	113.4	121.0	113.2	122.3	114.3
Other than petroleum	121.1	112.4	120.9	112.0	122.2	113.3
Chemicals	135.2	118.1	135.8	117.5	137.4	119.0
Explosives	105.5	84.3	103.5	85.6	107.8	86.3
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	131.3	118.9	131.3	118.8	133.3	119.3
Other than petroleum	130.2	114.8	130.3	113.9	132.0	114.7
Chemicals	158.2	132.0	159.8	130.2	162.1	132.2
Explosives	127.5	97.1	120.9	95.1	128.7	99.7
Price index chemicals	81.0	79.4	80.9	79.7	81.1	80.0
Chem. and drugs	78.1	76.3	78.1	76.7	78.1	76.7
Fert. mat.	72.9	69.3	74.0	70.2	74.5	68.6
Paint and paint mat.	86.8	80.5	87.2	81.0	85.5	81.0
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials	.....	85,095	56,000	85,542	70,905	133,295
Ammonium sulfate	.....	437	12,315	2,096	8,666	2,482
Total phosphate rock	.....	62,068	20,590	68,897	30,148	91,350
Total potash fertilizers	.....	2,132	724	2,144	5,103	3,945
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials	.....	110,847	148,000	145,995	132,461	146,937
Ammonium sulfate	.....	6,746	6,492	7,611	6,125	12,547
Sodium nitrate	.....	54,552	56,627	68,854	59,518	32,336
Total potash fertilizer	.....	6,795	41,798	20,186	18,161	66,897

INDUSTRIAL TRENDS



Business: General business conditions, which experienced sharp decline during first two months of this year, gave indications that downward swing was checked during early part of March. However, sagging tendency re-exerted itself during last three weeks of month, and although declines have been slight it seems that leveling out point has not yet been reached.

Steel: Rate of operations has continued to drop. For week beginning March 25 rate was 60.7, a decline of 5.2 from February 26. This decline was much less rapid than preceding month when the rate dropped 16.3 points from January 22 to February 26. A point of balance between demand and production is believed near. March is traditionally one of the most active in the industry and has failed this year to live up to expectations. In contrast with dull domestic steel business is active rate in exports. Foreign business is not based so much on actual war buying as on orders from neutral nations, from Latin America and Scandinavian countries especially.

Commodity Prices: Downward movement of wholesale commodity prices which began in January continued through week ended March 23. Bureau of Labor Statistics commodity price index dropped from 78.6 on February 24 to 77.9 on March 23. Prices of nonferrous metals advanced from middle of February to middle of March. Steel scrap and textile materials declined somewhat.

Electric Output: Production of electrical energy by electric light and power industry of the United States for week ending March 23 is estimated at 2,424,350,000 kwh. This output is above the corresponding week of 1939 by 10.53% better than 1939 period.

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Retail Trade: Retail trade throughout country for week ended March 23 was 12% above corresponding period last year. This was expected because of the early Easter season. Gains were not uniform in various sections. The Atlanta district was up 38%, New York 11%, Chicago 6%, while Boston declined 1%.

Wholesale Trade: Wholesalers' sales for February were slightly below January level but well above February, 1939. Reports from 2,806 wholesale firms located in all sections showed total sales of $189,979,000 for February.

Automotive: February production in U. S. and Canadian factories amounted to 421,820 units, gain of 32.8% over year ago. Consumer deliveries set new February record by totaling 283,973 units, 40.8% above year ago and 3.7% higher than previous February peak set in 1929. March consumer sales are running at third best March level on record.

Carloadings: For three weeks prior to March 23 loadings of revenue freight have remained steady, maximum deviation from average being only about .17%. Loadings for this period have averaged 4.4% better than similar period in 1939 and 11.33% better than 1938.

Textile: Cotton textile mills activity continues decline from the high levels prevailing since early last autumn, in order to avoid building up large stocks. Activity at woolen mills, which decreased in December and January, declined further in February. Demand and production of rayon continues at levels above year ago, with both producers and weavers active. Department store inventories are low.

Outlook: Sharp decline of industrial activity that took place during February has been checked somewhat during March but trend is still downward. Normal seasonal increases have been delayed, particularly in steel. It is, therefore, felt that belated rises should soon appear to halt downward movement and possibly bring about increase in activity. Two public sources give opinion that industrial reaction is soon to level out. Federal Reserve Board anticipates smaller March decline in industrial index than that of February. Bureau of Agricultural Economics says decline is slackening and points to early end.

Manufacturers' inventory accumulations ceased in February. Department store stocks have been greatly diminished. Level of small home construction is rising. Consumer incomes are holding above last year's level.

Optimism that existed with respect to foreign trade is not so pronounced.

MONTHLY STATISTICS (cont'd)

	Feb. 1940	Feb. 1939	Jan. 1940	Jan. 1939	Dec. 1939	Dec. 1938
FERTILIZER: (Cont'd)						
Superphosphate e (Nat. Fert. Association)						
Production, total	.....	263,518	391,803	276,440	359,432	291,832
Shipments, total	.....	250,568	213,248	186,881	220,404	163,992
Northern area	.....	86,467	85,647	67,881	111,688	65,432
Southern area	.....	173,101	127,601	118,799	108,716	98,560
Stocks, end of month, total	.....	1,117,132	1,913,279	1,898,213	1,689,997	1,768,103
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	.....	684,765	428,643	450,581	189,564	219,046
Total, 12 southern	.....	628,996	380,009	438,805	187,942	217,180
Total, 5 midwest	.....	55,769	48,634	12,476	1,622	1,866
Fertiliser employment *i*	.....	77.2	102.8	102.9	102.2	92.3
Fertiliser payrolls *i*	.....	98.2	82.3	75.2	82.2	70.3
Value imports, fert. and mat. *d*	.....	$2,417	$3,260	$3,427	$2,920	$3,530
GENERAL:						
Acceptances outst'd'g *f*	$233	$248	$229	$255	$232	$269
Coal prod., anthracite, tons	3,544,000	4,114,000	5,622,000	4,952,000	3,862,000	4,533,006
Coal prod., bituminous, tons	39,270,000	34,134,000	46,940,000	37,750,000	37,283,000	36,541,000
Com. paper outst'd'g *f*	$226	$195	$219.4	$195.2	$269	$186
Failures, Dun & Bradstreet	1,042	1,202	1,237	1,567	882	875
Factory payrolls *i*	97.8	86.0	98.3	83.2	103.9	87.1
Factory employment *i*	101.4	93.6	101.5	89.3	104.0	94.0
Merchandise imports *d*	$199,775	$158,035	$241,897	$178,201	$232,738	$165,359
Merchandise exports *d*	$338,639	$216,157	$358,000	$210,000	$357,450	$266,358
GENERAL MANUFACTURING:						
Automotive production	403,627	303,220	432,101	342,168	452,142	388,346
Boot and shoe prod., pairs	35,572,595	35,924,582	33,884,856	33,561,000	28,411,553	29,987,849
Bldg. contracts, Dodge *j*	200,574	220,197	196,191	251,673	354,098	389,096
Newsprint prod., U. S. tons	81,455	70,868	84,126	77,264	77,836	75,855
Newsprint prod., Canada, tons.	231,823	200,631	251,032	208,382	240,656	209,753
Glass Containers, gross‡	.....	3,389	4,263	3,589	4,046	3,516
Plate glass prod., sq. ft.	.....	10,165,401	17,254,241	12,209,080	12,691,262	18,477,277
Window glass prod., boxes	.....	808,585	1,413,432	943,184	1,188,940	1,003,150
Steel ingot prod., tons	4,374,625	3,347,288	5,619,000	3,174,000	5,164,420	3,130,746
% steel capacity	69.62	54.72	83.18	52.48	85.57	52.79
Pig iron prod., tons	3,311,480	2,307,409	4,032,022	2,175,423	3,768,336	2,210,728
U.S. cons'pt. crude rub., lg. tons	.....	42,365	54,978	46,234	48,428	45,315
Tire shipments	4,118,030	3,639,778	4,276,512	4,057,370	4,740,112	4,170,808
Tire production	4,910,754	4,232,528	4,976,548	4,464,091	4,479,386	4,678,878
Tire inventories	10,156,918	9,572,553	9,388,742	8,932,245	8,688,215	8,497,932
Cotton consumpt., bales	662,659	562,580	730,143	598,132	652,695	566,307
Cotton spindles oper.	22,803,796	22,532,814	22,872,414	22,496,544	24,943,302	22,432,648
Silk deliveries, bales	22,485	33,219	29,506	40,816	21,128	35,204
Wool Consumption *s*	.....	31.2	34.4	30.9	32.6	29
Rayon deliv., lbs.	29,700,000	25,600,000	31,900,000	27,100,000	32,000,000	26,200,000
Hosiery (all kinds) *t*	.....	8,904,629	9,343,933	8,743,677	8,080,049	8,471,326
Rayon employment *i*	313.3	305.9	313.5	300.3	312.2	298.4
Rayon payrolls *i*	321.3	287.8	320.4	283.3	314.0	276.8
Soap employment *i*	84.4	79.9	83.5	79.1	84.9	78.9
Soap payrolls *i*	100.3	94.9	100.3	94.9	102.3	93.3
Paper and pulp employment *i*	113.2	106.3	114.1	105.5	115.6	106.3
Paper and pulp payrolls *i*	117.3	105.2	117.6	102.7	122.7	103.5
Leather employment	86.5	88.3	87.4	87.3	86.9	86.6
Leather payrolls *i*	83.6	87.3	86.1	85.8	86.5	85.1
Glass employment *i*	102.3	95.2	105.6	95.3	108.5	99.0
Glass payrolls *i*	108.3	97.9	113.1	96.6	118.3	104.3
Rubber prod. employment *i*	88.2	81.5	90.0	81.3	92.9	83.5
Rubber prod. payrolls *i*	88.3	81.0	94.1	82.2	99.1	86.8
Dyeing and fin. employment *i*	129.7	128.0	129.7	124.4	133.0	123.0
Dyeing and fin. payrolls *i*	108.1	111.9	109.5	106.2	116.4	106.5
MISCELLANEOUS:						
Oils & Fats Index ('28 = 100)	.....	54.7	59.3	56.2	59.9	57.5
Gasoline prod., *p*	.....	.....	52,351	48,119	52,691	48,026
Cottonseed oil consumpt., bbls.	.....	217,781	.....	229,666	.....	209,706
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 650 establishments	$26,537,573	$25,399,464	$28,666,635	$25,166,042	$26,810,005	$21,281,326
Trade sales (580 establishments)	$13,042,764	$13,145,314	$13,549,867	$12,406,701	$12,687,134	$9,885,307
Industrial sales, total	$11,146,277	$10,019,901	$12,317,340	$10,269,334	$11,589,021	$9,293,043
Paint & Varnish, employ. *i*	123.3	117.2	123.5	116.5	124.4	117.1
Paint & Varnish, payrolls *i*	129.3	117.9	128.5	115.3	130.0	117.6

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 census totals; *j* 000 omitted, 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted.

Dow Earnings Up

Dow Chemical Co. and subsidiaries report for nine months ended February 29, 1940, subject to audit, consolidated net profit of $5,495,945 after interest, depreciation and federal income taxes, equal after dividend requirements on 5% preferred stock, to $5.11 a share on 1,031,988 no-par shares of common stock.

This compares with net profit for nine months ended February 28, 1939, of $2,440,560, equal after preferred dividends, to $2.30 a share on 964,330 average common shares outstanding during that period.

For quarter ended February 29, last, indicated net profit (based upon a comparison of company's reports for six and nine months periods) was $2,050,835 or $1.91 a common share, comparing with $1,995,586 or $1.86 a common share in quarter ended November 30, 1939.

Allied Chemical Profits Increase

The Allied Chemical & Dye Corporation annual report reveals a sharp increase in earnings. Net income for 1939 was $21,042,211, equal to $9.50 per share, compared with net income for 1938 of $13,111,024, equal to $5.92 per share.

H. F. Atherton, president, in his letter to the stockholders, stated that an additional unit for the manufacture of nitrogen products at Hopewell, Va., and a plant for the production of synthetic phenol at Frankford, Pa., has been initiated.

Dividends and Dates

Name	Div.	Stock Record	Payable
Allied Chem. & Dye Corp., q.	$1.50	Mar. 9	Mar. 20
Aluminum Co. of Am., common	$1.00	Apr. 1	Apr. 15
Baker, (J.T.) Chem.	37½c	Mar. 18	Mar. 21
Chemical Fund, Inc., q.	08c	Mar. 21	Mar. 27
Commercial Alcohols, Ltd., pf., q.	10c	Mar. 30	Apr. 15
Corn Prods. Ref., q.	75c	Apr. 5	Apr. 20
pf., q.	$1.75	Apr. 5	Apr. 15
Dow Chem. Co., common, q.	75c	May 1	May 15
Eastern Magnesia Talc. Co., Inc.	$1.00	Mar. 20	Mar. 30
Harshaw Chem. Co.	25c	Mar. 21	Apr. 1
Hercules Powder Co., pf., q.	$1.50	May 3	May 15
Hooker Electrochemical pf., q.	$1.50	Mar. 21	Mar. 30
Interchemical Corp.	.40	Apr. 20	May 1
Koppers Co., 6% pf., q.	$1.50	Mar. 11	Apr. 1
Lindsay Light & Chemical Co., pf., q.	$1.75	Mar. 8	Mar. 15
National Lead	12½c	Mar. 15	Mar. 30
Niagara Alkali Co. 7% pf., q.	$1.75	Mar. 16	Apr. 1
Southern Acid & Sulfur Co. 7% pf., q.	$1.75	Mar. 18	Mar. 25
Union Carbide & Carbon Corp.	60c	Mar. 8	Apr. 1
U. S. Rubber Reclaiming prior pf.	†50c	Mar. 30	Apr. 2
Westvaco Chlorine Prods., q.	35c	Apr. 10	May 1

Earnings Statements Summarized

Company:	Annual dividends	Net income 1940	Net income 1939	Common share earnings 1940	Common share earnings 1939	Surplus after dividends 1940	Surplus after dividends 1939
Air Reduction Co.:							
Year, Dec. 31	*k* $1.50	$5,076,825	$3,769,337	$1.98	$1.47	$1,230,838	$564,347
Allied Chemical & Dye Corp.:							
Year, Dec. 31	*y* 9.00	21,042,211	13,111,024	9.50	5.92	1,115,320	*d*173,570
American Commercial Alcohol:							
Year, Dec. 31	*f* ...	100,627	†455,357	...	...	.....	.....
American Cyanamid Co.:							
Year, Dec. 31	§ .60	5,524,941	2,452,912	2.07	.91	3,849,728	849,312
American Potash & Chemical Co.:							
Year, Dec. 31	*k* 4.75	3,225,753	2,642,983	6.10	5.00	.....	.....
Consolidated Chemical Industries:							
Year, Dec. 31	*f* ...	603,890	117,241	*c*1.68	*a*.42	.....	.....
Corn Products Refining Co.:							
Year, Dec. 31	3.00	10,120,398	9,753,669	3.32	3.17	810,232	443,503
Dow Chemical Co.:							
Feb. 29 quarter	*y* 3.00	2,050,835	.....	1.91	...	.....	.....
Nine months, Feb. 29	*y* 3.00	5,495,945	2,440,560	5.11	*j*2.30	.....	.....
Fansteel Metallurgical Corp.:							
Year, Dec. 31	*f* ...	238,660	11,739	1.02	*p*1.55	.....	.....
Heyden Chemical Corp.:							
Year, Dec. 31	*y* 2.35	772,903	331,458	*h*5.98	*h*2.06	.....	.....
Koppers Co.:							
Year, Dec. 31	...	1,935,591	1,159,805	*p*9.68	*p*5.80	.....	.....
Interchemical Corp.:							
Year, Dec. 31	*y* .80	1,581,961	485,383	4.10	.30	1,073,989	87,700
Johns-Manville Corp.:							
Year, Dec. 31	*k* 2.75	4,164,719	1,455,302	4.28	1.09	1,302,219	505,302
Merck & Co., Inc.:							
Year, Dec. 31	1.75	1,856,830	579,356	5.26	1.00	.....	.....
Monroe Chemical Co.:							
Year, Dec. 31	*f* ...	95,287	81,128	.23	.09	.....	.....
Monsanto Chemical Co.:							
Year, Dec. 31	*y* 3.00	5,428,914	3,150,593	4.01	2.35	.....	.....
National Refining:							
Year, Dec. 31	*f* ...	68,887	†529,749	*p*1.10	...	.....	.....
Texas Corp.:							
Year, Dec. 31	*k* 2.00	32,886,807	23,139,030	3.02	2.13	11,134,529	1,388,709
Union Carbide & Carbon:							
Year, Dec. 31	*k* 2.00	35,847,400	25,173,412	*h*3.86	*h*2.77	17,573,074	7,107,076
United Chemicals, Inc.:							
Year, Dec. 31	*f* ...	221,766	42,290	*p*8.77	*p*1.47	.....	.....
U. S. Industrial Alcohol Co.:							
Year, Dec. 31	*f* ...	77,525	†667,656	.20	...	.....	.....
U. S. Smelting Refining & Mining:							
v Two months, Feb. 29	*y* 5.50	605,867	280,639	.68	.01	.....	.....
Victor Chemical Works:							
Year, Dec. 31	*y* 1.40	1,104,404	730,092	1.59	1.05	.....	.....

a On first preferred stock; *b* On second preferred stock; *c* On combined Class A and Class B shares; *d* Deficit; *f* No common dividend; *j* On average number of shares; *k* For the year 1939; *p* On preferred stock; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; n Preliminary statement; *h* On shares outstanding at close of respective periods; ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period; ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss.

Price Trend of Representative Chemical Company Stocks

	Mar. 2	Mar. 9	Mar. 16	Mar. 23	Mar. 29	Net gain or loss last mo.	Price on Mar. 31 1939	1940 High	1940 Low
Air Reduction, Inc.	49	49⅜	48½	49¼	49⅞	+⅞	31	58⅛	48⅛
Allied Chemical & Dye	174¾	176	178	179	179⅞	+⅛	166	180	171
Amer. Agric. Chem.	19¾	20	18¾	19½	20	+¼	16½	21	18¾
Amer. Cyanamid "B"	36½	39⅛	37⅞	38⅛	38⅞	+2⅜	21¾	39¾	31¾
Columbian Carbon	95½	95¼	95¾	98	97⅞	+2⅜	85¾	98	86
Commercial Solvents	13¼	13⅜	13¾	14½	15½	+2¼	10	15⅞	13
Dow Chemical Co.	155	162	147	157	160	+5	123½	162	142
Du Pont	184¾	186⅞	185	186¼	186	+1¼	141½	187⅛	175
Hercules Powder	88¼	92¼	94½	95	96½	+8¼	68½	97	87½
Mathieson Alkali	29	28¾	26	28½	30	+1	25½	31¾	25½
Monsanto Chem. Co.	107	108¾	110½	111	111¾	4¾	95	112½	104
Standard Oil of N. J.	43⅝	43⅞	43⅜	43¾	43⅝	...	45½	46½	42¾
Texas Gulf Sulphur	34	33⅝	33⅝	33⅝	33½	—½	28½	35½	32¾
Union Carbide & Carbon	84¼	84¾	84½	83	84	—¼	73¼	88⅜	78½
U. S. Industrial Alcohol	21⅛	22	21½	22½	25½	+4⅜	16	26¼	21

$35,847,000 Net for Union Carbide

The Union Carbide & Carbon Corporation, in its annual report for 1939, shows net income after provision for taxes, depreciation, depletion and fixed charges of $35,847,400, equal to $3.86 per share on 9,277,788 shares of capital stock outstanding. This compares with net income of $25,173,412.27, equal to $2.77 per share on stock outstanding at the close of 1938. The stock outstanding includes 187,500 shares issued on November 21, 1939, to acquire the assets of Bakelite Corporation, atlhough earnings of Bakelite Corporation prior to November 21, 1939, are not included in net income. Excluding these shares, net income was more than $3.93 per share.

Heyden Earnings Nearly Tripled

Report of Heyden Chemical Corp. and subsidiaries for year ended December 31, 1939, shows net profit of $772,903 after depreciation, federal income taxes, etc., equal after 7% preferred dividends, to $5.98 a share (par $10) on 125,497 shares of common stock, excluding 24,503 treasury shares.

This compares with net profit of $331,458 or $2.06 a share on 149,997 shares of common stock in 1938.

Current assets as of December 31, 1939, amounted to $1,282,218 and current liabilities were $826,060 compared with current assets of $1,277,410 and current liabilities of $303,068 at end of preceding year.

Chemical Finances

March, 1940—p. 56

Chemical Stocks and Bonds

March 1940 Last	March 1940 High	1939 Low	1939 High	1938 Low	1938 High	Low	Sales	Stocks	Par $	Shares Listed	Dividends	Earnings** $-per-share-$ 1939	1938	1937
						Number of shares								
NEW YORK STOCK EXCHANGE						March 1940	1940							
69	70¼	67	71½	53	61	46¼	4,300	11,800	Abbott Labs.	No	752,468	$2.05	2.61	2.43	2.51
50	58⅛	48⅛	68	45¼	67⅞	40	38,900	80,200	Air Reduction	No	2,563,992	1.50	1.98	1.47	2.86
179½	180	171	200½	151½	197	124	11,100	29,300	Allied Chem & Dye	No	2,214,099	9.00	....	5.92	11.19
19	21	18¾	24½	16	28½	22	2,100	8,000	Amer. Agric. Chem	No	627,987	1.30	....	2.23	2.95
7½	8¼	6⅝	11⅞	5½	15	9	6,200	11,800	Amer. Com. Alcohol	No	280,934	....	.38	—2.05	3.23
35	35½	31½	37	21	31½	20	3,100	5,700	Archer-Dan.-Midland	No	545,416	1.10	....	.43	5.03
72⅞	73	63	71	50	68	36	2,200	6,800	Atlas Powder Co.	No	250,288	3.00	3.82	2.69	4.40
117½	124⅜	117	127	116	126¼	105	390	850	5% conv. cum. pfd.	100	68,597	5.00	....	14.77	20.90
30½	31⅞	26⅜	30¼	13⅝	26⅝	9	94,300	194,600	Celanese Corp. Amer.	No	1,000,000	.50	3.53	.26	2.04
116¾	117	107½	109⅞	84	96	82	6,170	11,760	prior pfd	100	164,818	7.00	....	15.05	27.07
18½	20	16⅝	18	11½	17	7⅛	65,300	185,400	Colgate-Palm.-Peet	No	1,962,087	1.00	2.74	1.77	—.35
103⅛	106½	103⅛	107	101⅞	104¼	78	13,400	21,900	6% pfd.	100	125,000	6.00	....	21.12	3.21
97⅞	98	87⅞	96	73	98½	53¾	3,700	8,100	Columbian Carbon	No	537,406	4.50	5.32	5.13	8.31
15½	15⅞	13	16	8⅝	12¼	5⅞	140,100	301,500	Commercial Solvents	No	2,636,878	....	.61	—.11	.60
61¼	65⅛	58½	67½	54⅞	70¾	53	24,800	47,600	Corn Products	25	2,530,000	3.00	....	3.18	2.52
174⅝	177	170	177	150	177	162	600	1,600	7% cum. pfd.	100	245,738	7.00	....	39.69	32.96
19⅝	23¼	18¾	32⅝	18	40⅞	25	2,440	6,060	Devoe & Rayn. A.	No	95,000	....	2.05	—1.72	4.05
164	164	142	144⅝	101½	141	87⅞	12,100	25,800	Dow Chemical	No	945,000	3.00	....	3.91	4.15
186	187⅛	175	188½	126¼	154¾	90½	31,700	81,500	DuPont de Nemours	20	11,065,762	7.00	7.70	3.74	7.37
126	126	122	124⅛	112	120½	109½	4,900	21,650	4½% pfd.	No	500,000	4.50	....	87.27	165.48
151½	166¾	145⅞	186⅛	138⅛	187	121½	14,500	36,900	Eastman Kodak	No	2,250,921	6.00	....	7.54	9.76
171	178	168½	183½	155½	173	157	180	500	6% cum.	100	61,657	6.00	....	281.22	362.45
34	35	31⅞	36	18¾	32	19⅞	12,000	35,500	Freeport Texas	10	796,380	1.50	....	1.87	3.30
9⅛	10	9	10⅞	7	12⅛	6¾	4,900	13,100	Gen. Printing Ink	1	735,960	.80	.94	.62	1.32
17¾	19¾	16¾	24½	14	28½	13	7,900	30,300	Glidden Co.	No	829,989	.50	....	—.29	2.62
44	44⅝	38½	47	34	51½	37	1,700	4,200	4½% cum. pfd.	50	199,940	2.25	....	1.08	12.72
112	113¼	107	112¼	93	111	76¾	1,000	4,000	Hazel Atlas	25	434,409	5.00	6.64	4.97	6.67
96½	97	87½	101½	63	87	42¾	16,600	29,700	Hercules Powder	No	1,316,710	2.85	3.65	1.95	2.97
132¾	133½	131	135½	128½	135¼	126¾	390	1,600	6% cum. pfd.	100	96,194	6.00	....	35.31	50.75
26⅞	29	25½	29½	16⅝	30⅝	14⅜	7,300	19,300	Industrial Rayon	No	759,325	.75	1.77	.24	.34
45	47⅜	40	46¼	17½	34½	15	13,600	23,800	Interchem.	No	290,320	.40	4.10	.33	1.44
112	113	108	109½	90	98	80	1,110	2,470	6% pfd.	100	65,661	6.00	...	7.39	12.26
1¾	2⅛	1⅝	3⅝	1½	3⅞	2	3,500	21,100	Intern. Agricul.	No	436,048	....	....	....	.16
33½	38	32⅛	41	16	29	15	1,700	4,800	7% cum. pfd.	100	100,000	....	....	7.01	7.70
33	38⅞	32	55¾	35	57⅝	36⅞	104,600	240,100	Intern. Nickel	No	14,584,025	2.00	2.39	2.09	3.31
36	36⅜	34⅝	38	29	30¼	19½	1,700	3,100	Intern. Salt	No	240,000	1.75	1.92	2.29	2.11
22½	23½	21	22½	14½	24	19⅛	1,700	4,500	Kellogg (Spencer)	No	509,213	1.10	....	.71	2.81
49½	53⅜	48¼	56¾	36½	58⅜	23¼	15,400	45,500	Libbey Owens Ford	No	2,513,258	2.75	3.21	1.57	4.19
18¼	18⅜	15½	19	13½	21½	12¼	9,000	36,800	Liquid Carbonic	No	700,000	1.00	....	1.81	2.37
30	31¾	25½	37⅜	20⅜	36⅞	19⅜	11,800	25,800	Mathieson Alkali	No	828,171	1.50	1.12	1.01	1.81
112¼	112½	104	114¾	85¾	110	67	11,600	44,800	Monsanto Chem.	No	1,241,816	3.00	4.01	2.35	4.40
118	118	116½	121	110	117½	111	350	740	4½% pfd. A.	No	50,000	4.50	....	31.51	49.99
118	121½	118	122½	112	...	...	120	500	4½% pfd. B.	No	50,000	4.50	....	31.51	49.99
21⅛	22	19⅛	27½	17⅞	31	17⅛	27,300	74,200	National Lead	10	3,095,100	.87	....	.75	.95
166	173⅜	166	173½	152	178½	154	1,300	2,200	7% cum. "A" pfd.	100	213,793	7.00	....	26.03	22.86
145	148½	140	145	132	145½	127	230	1,090	6% cum. "B" pfd.	100	103,277	6.00	....	35.97	43.77
12⅜	14¼	11¼	17⅞	8½	19½	9⅞	15,000	51,900	Newport Industries	1	620,459	....	.66	—.08	2.22
62¼	64⅝	59½	70	50	76¼	40	12,800	41,300	Owens-Illinois Glass	12.50	2,661,204	2.00	....	2.02	3.51
68¼	69⅞	65⅜	66	50⅝	59	39½	15,200	51,500	Procter & Gamble	No	6,325,087	2.25	....	2.59	4.08
115½	118½	112⅝	119¾	112	122¼	114	1,820	3,590	5% pfd.	100	169,517	5.00	....	101.81	157.05
11⅞	13⅛	10⅝	17¼	9⅞	18⅝	10	25,900	46,200	Shell Union Oil	No	13,070,625	.50	.77	.70	1.44
107¼	108¼	105	107⅞	98½	106½	93	1,100	4,100	5½ cum. pfd.	100	341,000	5.50	....	33.18	60.59
19	22¼	18½	29½	15½	34¾	18½	3,800	9,400	Skelly Oil	No	995,349	.75	....	2.27	6.37
102 13	103½	99¼	98¼	92	98	84	3,000	10,000	6% cum. pfd.	100	64,500	6.00	....	41.09	97.86
27⅜	27¾	25	30	22⅜	35½	24⅝	52,600	123,000	S. O. Indiana	25	15,272,020	1.25	....	1.82	3.16
43⅜	46½	42⅜	53½	38	58⅜	39⅜	70,500	211,800	S. O. New Jersey	25	26,618,065	1.25	....	2.86	5.64
6⅜	7	5⅝	9⅛	4	8	3⅞	8,400	15,000	Tenn. Corp.	5	853,696	....	.41	.46	1.09
45¼	46⅞	42⅝	50¾	32½	49⅝	37⅝	71,300	168,800	Texas Corp.	25	10,876,882	2.00	3.02	2.13	5.72
33⅛	35½	32¾	38½	26	38	26	17,600	43,500	Texas Gulf Sulphur	No	3,840,000	2.00	2.04	1.81	3.02
84	88⅜	78½	94¼	65½	90⅞	57	34,400	100,700	Union Carbide & Carbon	No	9,277,288	1.90	3.86	2.77	4.81
62¼	65¼	54⅝	69½	52	73½	39	4,800	10,600	United Carbon	No	397,885	3.00	3.81	3.78	5.91
25	28¼	21	29⅜	13½	30¼	13½	9,800	25,700	U. S. Indus. Alcohol	No	391,238	....	.20	—1.08	1.24
25¼	35⅜	28⅜	40	16	28⅞	11½	27,900	62,900	Vanadium Corp. Amer.	No	377,140	1.00	3.25	.61	2.22
30	31¼	28¾	29⅜	18¼	25¼	13½	4,700	10,600	Victor Chem.	5	696,000	1.40	1.59	1.05	1.01
3¼	4⅛	3	5¾	2½	5⅝	2¾	4,900	12,500	Virginia-Caro. Chem.	No	486,122	....	....	—1.80	—.05
28½	31⅜	27½	33¾	17	32½	15¾	2,500	9,800	6% cum. part. pfd.	100	213,052	....	....	1.90	5.88
36	38½	33½	39¼	15¾	20¼	10	3,700	16,200	Westvaco Chlorine	No	339,362	1.85	....	1.52	1.46
36½	39¼	35⅜	39½	29	31½	20	2,100	7,600	cum. pfd.	30	192,000	1.50	....	4.19	4.09
NEW YORK STOCK EXCHANGE															
39	39¾	31¾	35¾	18⅜	30¼	15½	59,700	165,200	Amer. Cyanamid "B"	10	2,618,387	.60	2.07	.91	2.09
118¼	118⅜	105	112⅜	76	92	50	3,275	7,650	Celanese, 7% cum. 1st pfd.	100	148,179	7.19	....	8.95	22.32
4¼	5⅞	3½	6¾	3	6¾	3	500	5,800	Celluloid Corp.	15	194,932	....	....	—2.73	—.92
7	7¾	7	7⅞	4½	12	6½	.....	700	Courtauld's Ltd.	£1	24,000,000	.13	....	.26%	8.64%
6⅞	7⅞	6½	9¼	5	9⅞	6	1,600	5,600	Duval Texas Sulphur	No	500,000	....	1.25	.71	.43
77½	79½	67	88	30	41¼	27	1,675	6,675	Heyden Chem. Corp.	100	125,497	2.00	5.98	2.07	3.94
101½	104	99	117	90	115½	55	4,400	14,600	Pittsburgh Plate Glass	25	2,192,824	4.00	4.94	3.00	8.53
96	96½	89	113½	81	117⅜	66	5,800	14,000	Sherwin Williams	25	638,927	2.75	....	2.43	8.76
113½	114¾	111	116	106½	114⅛	107	130	540	5% cum. pfd.	50	132,189	5.00	....	8.76	45.50
PHILADELPHIA STOCK EXCHANGE															
171	175	166¼	179	135	167	121½	375	1,325	Pennsylvania Salt	50	150,000	6.00	10.52	6.90	11.79

March 1940 Last	March 1940 High	1939 Low	1939 High	1938 Low	1938 High	Low	Sales	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE						March 1940	1940					
104¼	105¼	102	103¾	98	105⅝	99⅛	97,000	462,000	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
39	40	34	41½	19	38	25⅛	145,000	356,000	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
105½	107¼	105½	108⅜	101¾	106⅛	102⅜	64,000	162,000	Dow Chemical	1951	3	J-D	5,000,000
105⅜	105⅜	101	102½	90	94	93	228,000	543,000	Industrial Rayon	1948	4½	J-J	7,100,000
38½	39¾	34¼	37	21½	35⅜	24¾	165,000	525,000	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
21	21	21	30	16	35⅜	24¾	5,000	5,000	Ruhr Chem.	1948	6	A-O	1,500,000
96⅜	96½	95	95¾	88¾	...	...	499,000	1,457,000	Shell Union Oil	1954	2½	J-J	85,000,000
105½	106¼	104⅝	106¼	97⅜	105⅜	100	209,000	635,000	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
105⅜	105¾	104¾	106½	94¼	103	98	152,000	481,000	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
107½	107½	105½	108⅝	102	103	95	311,000	688,000	Texas Corp.	1951	3½	J-J	60,000,000
105¾	106½	104⅝	105⅞	95¼	...	...	253,000	821,000	Texas Corp.	1959	3	A-O	40,000,000
101⅛	105	101	118½	96	101	77	10,000	191,000	Vanadium Corp. conv.	1941	5	A-O	2,700,000

* Paid in 1939, including extras but excluding dividends paid in stock.

** For either fiscal or calendar year.

U. S. Chemical Patents

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A Complete Check—List of Products, Chemicals, Process Industries

Agricultural Chemicals

Fertilizer containing selectively calcined dolomite. No. 2,193,842. Clarence R. Rex.

Cellulose

Method conditioning cellulose for chemical treatment by subjecting water-saturated cellulose to distillation in presence of low molecular weight fatty acid. No. 2,191,525. The Cellulose Research Corp.

Non-bronzing maroon cellulose nitrate coating composition of cellulose nitrate, an alkyd resin and azo pigment. No. 2,191,530. E. I. du Pont de Nemours & Co.

Process imparting to organic cellulose derivative structure an affinity for dyestuffs, comprises uniting said structure with non-cellulosic, non-proteinous polymeric compound containing at least 2% amino nitrogen. No. 2,191,887. E. I. du Pont de Nemours & Co.

Flexible, durable, water-sensitive cellulosic structures containing as softeners different organic compounds as softeners. Nos. 2,191,894-897. E. I. du Pont de Nemours & Co.

In process for pulping raw ligno-cellulosic materials step consisting of digesting same with treating liquid comprising at least 70% alkylolamine. No. 2,192,202. Floyd C., Peterson and Louis E. Wise.

In art of sizing and desizing regenerated cellulose materials, step comprising applying to material a permanently water dispersible composition containing an amylaceous substance and urea. No. 2,192,218. Stein, Hall & Company, Inc.

Sizing of cellulose ether and ester materials. No. 2,192,219. Stein, Hall & Company, Inc.

Improvement in acid sulfite process for recovery cellulose from ligno-cellulose materials comprises submerging portion only of material in concentrated solution of a bisulfite from class consisting of alkali metal bisulfites and magnesium bisulfite. No. 2,192,239. Weyerhaeuser Timber Company.

Method producing organic acid esters of cellulose of low viscosity characteristics comprises esterifying cellulose in presence of strong esterification catalyst and with regulated temperatures. No. 2,192,277. Celanese Corporation of America.

Process for manufacture laminated cellulosic fabric. No. 2,192,297. Imperial Chemical Industries, Ltd.

Process preparing organic acid esters of cellulose. No. 2,193,033. Eastman Kodak Company.

In bleaching cellulose fibers in alkaline peroxide baths, the step comprising pre-treating material in bath containing per litter .001 to .01 gram of cobalt in form of water-soluble salt. No. 2,193,173. General Aniline & Film Corporation.

In method bleaching cellulose pulp with chlorinating agent, steps comprising forcing pulp through jet apparatus, drawing chlorinating agent into jet apparatus by suction whereby intimate contact and mixing takes place. No. 2,193,301. Aschaffenburger Zellstoffwerke Aktiengesellschaft.

Composition comprising solution of cellulose derivatives in volatile solvent for use in moisture proofing. No. 2,193,831. E. I. du Pont de Nemours & Co.

In bleaching of cellulosic materials with chlorites, improvement comprising forming aqueous pulp of cellulosic material containing the chlorite at a pulp density in excess of about 15% under conditions such that the chlorite is substantially inactive and thereafter activating the chlorite. No. 2,194,956. The Mathieson Alkali Wks., Inc.

Combination of primary charge consisting of "safety" type primary detonator composition and an ignition medium for a detonator. No. 2,195,032. Atlas Powder Company.

Improvement in high density pulp bleaching of cellulosic material by chlorites. No. 2,195,302. The Mathieson Alkali Wks., Inc.

Process of producing cellulosic pulp. No. 2,195,378. Chemipulp Process, Inc.

Artificial cellulosic filaments having increased affinity for acid dyes and containing finely dispersed within the body of the filaments the condensation product of cyanamide with an aliphatic aldehyde having at least two carbon atoms. No. 2,195,210. I. F. Farbenindustrie Aktiengesellschaft.

Chemical Specialty

Preparation highly active adherent catalytic surface comprises activating a metal with highly alkaline hypohalite. No. 2,191,464. Marion H. Gwynn.

Production synthetic hydrocarbon for wood preservative. No. 2,191,466. One-half to Jacquelin E. Harvey, Jr., one-half to Southern Wood Preserving Company.

Method coating base metal with metal veneer. Nos. 2,191,469-470. Robert K. Hopkins.

Process preventing or reducing sludge formation in scrubbing medium that is reactivated by distillation. No. 2,191,486. Tennessee Eastman Corp.

Mineral oil comprising mixture of liquid oils, waxy hydrocarbons and small amount wax-substituted phenol. No. 2,191,498. Socony-Vacuum Oil Company, Inc.

Multicolor photographic film. No. 2,191,502. Du Pont Film Mfg. Co.

Edible dried, partially pasted, water absorbent starch-protein food composition. No. 2,191,509. American Maize-Products Company.

Manufacture porous building products, step of including in cementitious material reactants which form nitrogen gas in situ. No. 2,191,555. E. I. du Pont de Nemours & Co.

Insulated electrical conductor with insulation made from polymerized acrylic acid ester and polymerized acrylic acid nitrite. No. 2,191,580. General Electric Company.

Method of sealing an opening in the earth by use of potentially hard-enable calcined gypsum. No. 2,191,652. United States Gypsum Company.

Method forming refractory cellular insulating body. No. 2,191,658. Pittsburgh Plate Glass Company.

Substantially anhydrous grease composition suitable for lubrication. No. 2,191,675. Standard Oil Development Co.

In preparation of tablets by compressing granulations, step of incorporating a lubricant consisting of water-insoluble soap. No. 2,191,678. E. R. Squibb & Sons, N. Y. C.

In process treating fruit (papayas) for sterilization from insect infestation, steps of conditioning fruit to withstand such treatment. No. 2,191,695. Josef J. Holzman, Los Angeles.

Sterilizing system. No. 2,191,799. McKenna-Rott Equipment Corp.

Method sensitizing photographic silver halide emulsions. No. 2,191,810. Gevaert Photo-Producten N. V.

Food product and process for manufacture. No. 2,191,835. Marjorie G. Snelling.

In preparation hop extract, step of effecting extraction with suitable organic solvent in an atmosphere of CO_2. No. 2,191,838. Louis Anton Freiherr von Horst.

Preparation of material which when in water-soluble form has property of converting hides and skins to leather comprises co-condensing a phenol with a disulfonamide and an aldehyde in strongly acid solution. No. 2,191,943. Rohm & Haas Company.

In preparing catalyst for oxidizing hydrochloric acid to chlorine, steps of passing HCl and O_2 through catalytic mass. No. 2,191,981. Alan N. Mann.

Method of utilizing combustion gases for heating. No. 2,191,985. Experimental Laboratories, Inc.

Method of activating clay by means of sulfuric acid. No. 2,192,000. Monsanto Chemical Company, St. Louis.

Method of improving and regularizing antimony electrode determinations. No. 2,192,123. The Champion Paper & Fibre Company.

Process for preparing improved hydrogenation catalysts in lump form. No. 2,192,125. Standard I. G. Company.

Method conditioning air to moisture unsaturated state, includes absorbing moisture from current of air by action of concentrated solution of volatile hygroscopic compounds. No. 2,192,126. The Calorider Corp.

Method removing suspended particles from gases comprises subjecting gas to action of corona discharge. No. 2,192,172. Western Precipitation Corporation.

Laminated safety glass having high resistance to shattering under impact. No. 2,192,196. Eastman Kodak Company.

Method of manufacturing articles of food from Indian corn. No. 2,192,212. Theodore B. Wagner.

Nonbitter starch conversion sugar product and process of manufacture. No. 2,192,213. American Maize-Products Company.

Photographic layer and process of producing same. No. 2,192,241. Gevaert Photo-Producten.

Peeled ripened banana body having outer layer of cells disrupted and partially dried to a condition of stability and the juices of remaining portion substantially evenly distributed throughout the body. Process of forming above mentioned body. No. 2,192,273. The Anglo California National Bank of San Francisco.

New composition of matter for therapeutical, disinfectant and sterilizing purposes, consisting of homogeneous mixture finely divided gold, silver and higher valency compound of a metal capable of existing in a plurality of valencies and of a higher solution tension than hydrogen. No. 2,192,285. Interpublic A.-G.

Aqueous dispersions of synthetic polymeric materials. No. 2,192,318. E. I. du Pont de Nemours & Co.

Palatable antianemic preparation comprising essentially desiccated autolyzed-liver concentrate and flavoring agent having cooked meat flavor. No. 2,192,326. E. R. Squibb & Sons.

Insecticidal spray comprising a mineral oil base, para-tart, -amyl-phenol, and organic secondary solvent. No. 2,192,347. The Gulf Oil Corporation.

In process making insulin preparation, steps comprising forming solution of insulin and compound selected from group consisting of camphor, camphoric acid, a salt of camphor, a halogenated derivative of camphor and a sulphonated derivative of camphor, and adjusting pH of solution to be below the isoelectric point of insulin. No. 2,192,386. Frederick Stearns & Co.

Ergot preparation and process for making same. No. 2,192,460. Eli Lilly and Company.

Nonhygroscopic starch conversion products and methods of manufacture. Nos. 2,192,951-952. American Maize-Products Co.

Photographic silver halide emulsion containing color, former selected from group consisting of coumaranones and benzcoumaranones, containing at least one substituent in the carbocyclic ring taken from group consisting of alkyl, lower alkoxy and halogen radicals. No. 2,192,929. Ilford Limited.

Glyceryl sulphonated oil compound for three sprays. No. 2,193,216. Standard Oil Company, corp. of Ind.

Nickel borate catalyst for hydrocarbon decomposition. No. 2,193,814. Standard Oil Company, corp. of Ind.

Composite laminated insulation material. No. 2,192,517. Woodall Industries, Inc.

Apparatus for making mineral wool from suitable molten material. No. 2,192,524. Johns-Manville Corp.

Resilient sheet. No. 2,192,573. Commercial Ingredients Corp.

Liquid adhesive comprising water solution of partially converted dextrine, urea, and Na Cl. No. 2,192,585. Russia Cement Company.

Cattle feed and process for making same. No. 2,192,611. Corn Products Refining Co.

Production detergent aids comprises treating low-boiling mono-olefin with H_2SO_4 to secure product comprising alkyl sulfates, "sulfo acids" and unreacted H_2SO_4, and then separating sulfo-acid compounds. No. 2,192,713. Standard Oil Development Company.

Luminescent material effective, upon excitation, to produce a "white" light. Said material having general formula. $(X)ZnBeSiO_4.(Y)ZnSiO_3.(Z)MnSiO_3.Fe$ wherein the relationship of the components is X, 121; Y, 1; Z, 7; and Fe .01-.001% by wt. and where molal relationship of zn to Be in X component is 1 to 1. No. 2,192,864. General Luminescent Corp.

Novel mineral oil composition containing small amount of the mineral oil soluble constituents derived from dehydrated olive paste. No. 2,192,866. Musher Foundation Inc.

In development of photographs the application to exposed silver halide emulsion of aqueous solution containing a developing medium for said solution and also a halogen-substituted aminopyridine. No. 2,192,891. Helmut Borst.

Organic insecticidal composition. No. 2,192,894. Monsanto Chemical Co., St. Louis.

Cosmetic preparation containing proportion of chemical compound in form of lyophillic higher molecular wt. aliphatic acid ester of an aliphatic polyhydroxyl substance with an aliphatic polycarboxylic acid. No. 2,192,907. Benjamin R. Harris.

Method of producing moistureproof fiber containers. No. 2,192,923. American Can Company.

Organic insecticidal composition. No. 2,192,927. Monsanto Chemical Co., St. Louis.

Shoe filler composition and method of making. No. 2,192,934. Ernest D. Sackett, assignor ½ to Parshad Holding Corporation.

Method forming colored photographic image employs use of a thioglycollic amide containing group selected from class consisting of aromatic and heterocyclic groups to convert silver halide into colored silver salt. No. 2,193,011. Eastman Kodak Company.

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Photographic developer containing sulfonamide groups. No. 2,193,015. Eastman Kodak Company.

Method forming photographic reversal image having substantially neutral gray color. No. 2,193,023. Eastman Kodak Company.

Composition for matches including igniting element, bulk filler, combined hardener and binder consisting of polyhydric alcohol esterified with a polybasic acid. No. 2,193,124. Herbert R. MacMillan.

Manufacture metal bonded abrasive articles. No. 2,193,265. The Carborundum Company.

Milk of magnesia containing alkali-metal tripolyphosphate in amount sufficient to act as dispersing agent and to prevent milk of magnesia from forming curds which gum up container. No. 2,193,281. Hall Laboratories, Inc.

Process recovering soaps of high molecular aliphatic carboxylic acids from mixtures containing them besides unsaponifiable constituents. No. 2,193,321. I. G. Farbenindustrie Aktiengesellschaft.

Soap composition comprising kettle soap and sodium silicate in certain proportion, colloidal dispersing agent and sudsing material. No. 2,193,329. Harris Soap Company.

Solution of alkali metal salts of phenols. No. 2,193,336. American Cyanamid Company.

Molded product comprising sand, liquid binder and asphalt emulsion, said liquid binder comprising aqueous solution obtained by combining aluminum sulfate and alkali metal fluosilicate with large excess of aqueous solution of water soluble silicate. No. 2,193,346. Allan B. Ruddle.

Process making plastic dry hydraulic lime preparation in pulverulent form. No. 2,193,391. William E. Carson.

Heat Insulating Glass. No. 2,193,393. Edward Danner.

Sound deadening composition comprising about 15-30% aqueous clay type emulsion of thermoplastic bituminous material, 6-40% filler not less than 30% aqueous inorganic salt solution of substantially 50-60% concentration, said inorganic salt having fireproofing properties. No. 2,193,401. Benjamin Foster Company.

Preparation zinc oxide catalyst, comprises decomposition by heat of molten anhydrous organic zinc salt having decomposing temp. above melting temp. No. 2,193,464. Giulio Natta.

Confection of gum or jelly type which contains thin boiling canna starch. No. 2,193,470. Corn Products Refining Company.

Composition comprising mixture of different, separately produced, synthetic polyamides. No. 2,193,529. E. I. du Pont de Nemours & Co.

Heat insulating materials. No. 2,193,546. Union Asbestos & Rubber Company.

A light sensitive photographic layer suitable for production colored images. No. 2,193,574. Shell Development Company.

Method comprising plasticizing gamma polyvinyl chloride. No. 2,193,613. The B. F. Goodrich Company.

Plasticized composition comprising gamma polyvinyl chloride and compound of formula R_1-O-R_2 where R_1 is of naphthyl and xenyl groups, R_2 of aliphatic or alicyclic groups of not more than 6 C atoms. No. 2,193,614. B. F. Goodrich Company.

Method preserving bakery products comprises bringing aqueous solution stable ammonium salt of strong mineral acid into contact with atmosphere in which products are stored to regulate partial pressure of water vapor and to inhibit mold growth. No. 2,193,622. Toledo Scale Manufacturing Co.

Hardener for formaldehyde-urea adhesives. No. 2,193,630. Plaskon Company, Inc.

Lubricant for ammunition comprising mixture of palmityl and stearyl alcohols. No. 2,193,631. Remington Arms Company, Inc.

Process preventing congealing of blood comprises adding to the blood water soluble amino acid containing in the molecule more than one organic radical having carboxylic group on each basic nitrogen atom. No. 2,193,717. I. G. Farbenindustrie Aktiengesellschaft.

Method for cementing earth wells. No. 2,193,807. Dow Chemical Company, Midland, Mich.

Method forming well strainer in situ by introducing concrete containing fragments of Ca CO_3 between productive zone and a well, and then using acid to eat away fragments of Ca CO_3 to render it porous. No. 2,193,808. The Dow Chemical Company, Midland, Mich.

High viscosity medicinal white oil of high storage qualities and improved taste. No. 2,193,819. L. Sonneborn Sons, Inc.

Process separating oil and meal from animal raw material. No. 2,193,871. The De Laval Separator Company.

Process recovering vitamin B complex from brewers yeast. No. 2,193,876. Vico Products Company.

Process for producing multicolored photographic images. No. 2,193,931. Bela Gaspar.

Improvement in preparation bonded articles by assembling a ply with a base and interposed binder layer and subjecting to heat and pressure, consists in use of a binder of heat reactive phenol-aldehyde resin. No. 2,193,941. Bakelite Corporation.

Production smooth consistency product as to its sugar content, said product having greater percentage of sugar than can normally be carried without producing sandiness, consists in providing a finely divided material upon which the sugar can crystallize. No. 2,193,950. Grover D. Turnbow, assignor ½ to C. E. Gray.

Lap grinding compound comprising an abrasive and an alkyl phosphate salt. No. 2,193,965. Monsanto Chemical Co., St. Louis.

Mixture capable of being formed into mineral wool comprising about 50% oxides of silicon and aluminum, 35% iron oxide and 10% calcium and magnesium oxides. No. 2,193,982. Charles F. Ramseyer.

Laminated safety glass bonded with synthetic thermoplastic material modified by the incorporation of a certain plasticizer. No. 2,194,013. Pittsburgh Plate Glass Company.

Method conducting stained antigen test for pullorum disease in fowls. No. 2,194,131. Robert W. Terry.

Process and device for influencing the roots of the hair by means of chemical substances. No. 2,194,173. Bernhard Joos van Tysen.

Crystal rod cut from piezo electric salts especially Rochelle salt adopted to be used for oscillatory crystal work. No. 2,194,183. Allgemeine Elektricitats Gesellschaft.

Method of producing vitamin D. product. No. 2,194,188. The Borden Company.

Process for purifying raw saccharine juices. No. 2,194,195. Leopold Charles Ambrose.

Manufacture starch adhesive and adhesive base. No. 2,194,216. Philip Dalton Coppock.

Stable emulsion comprising water, a liquid immiscible with water and activated gelatinous alumina. No. 2,194,218. Thurston Wyatt Dickeson.

Preparation for improving enamels, glazes and the like containing 30-50% silicic acid, 10-30% boric acid, 15-30% magnesium oxide and 10-20% alkali compounds. No. 2,194,246. Sioto G.m.b.H.

Apparatus for manufacture granular coated webs. No. 2,194,253. The Carborundum Corporation.

Stencil sheet provided with coating of aqueous ethyl alcoholic solution of zein and a plasticizing agent comprising dibutyl tartrate, castor oil and diglycol stearate. No. 2,194,291. Corn Products Refining Company.

Process of making photographic prints in color. No. 2,194,293. Rowland S. Carter.

Method removing from starch converted dextrose liquors soluble salts of metals below sodium in electromotive series. No. 2,194,315. Corn Products Refining Company.

Crystalline zirconium oxide obtained by calcination of zirconium- oxygen-carbon compound. No. 2,194,426. The Titanium Alloy Manufacturing Company.

Asphalt coated material for construction, roofing and the like. No. 2,194,428. The Patent and Licensing Corporation.

Method for sanitary disposal of waste cyanide liquor comprises reacting liquor under alkaline conditions with substance selected from group consisting of elemental sulfur in polysulfide form. No. 2,194,438. E. I. du Pont de Nemours & Company.

Method preventing dusting of solid commercial fuel comprises coating with hydrocarbon polymers. No. 2,194,439. The Pure Oil Company.

Pest destroying emulsion consisting of poison of group consisting of rotenone, di-hydro-rotenone, pyrethrines, pyrethrum- and derris-root extracts. No. 2,194,446. Deutsche Hydrierwerke Aktiengesellschaft.

Abrasive article comprising a backing and coating of abrasive grain held on said backing with adhesive binder. No. 2,194,472. The Carborundum Company.

Non-halogenated compounded lubricant of extreme pressure type. No. 2,194,478. Shell Development Company.

Priming mixture consisting of red phosphorous, a nonexplosive and non-corrosive fuel. No. 2,194,480. Charles H. Pritham, Ernest R. Rechel and Thomas Stevenson.

Corrosion inhibiting solution containing mercaptobenzothiazole and salt selected from group consisting of soluble phosphites and hypophosphites. No. 2,194,491. Paul G. Bird and Roland M. Waters.

Improved motor fuel comprising blend of gasoline, ethyl alcohol and dehydrated "light oil" fraction produced by distillation of hardwood. No. 2,194,495. The Chemical Foundation, Inc.

Denatured alcohol-containing motor fuel for internal combustion engines characterized by high anti-knock value. No. 2,194,496. The Chemical Foundation, Inc.

Contact insecticide. No. 2,194,517. E. I. du Pont de Nemours & Company.

Process for producing commercial gas. No. 2,194,575. Fuel Research Development Corp.

Process for activating silver surface catalysts for use in affecting direct chemical combination of olefines with molecular oxygen to form olefine oxides. No. 2,194,602. Carbide & Carbon Chemicals Corp.

Process for manufacturing white leather. No. 2,194,610. R. T. Vanderbilt Co., Inc.

Method of coloring vitreous articles and product produced thereby. No. 2,194,611. Libbey-Owens-Ford Glass Co.

Transparent film comprising organic matrix and upwardly of 2% lead silicate dispersed therein, whereby film is absorptive of ultra violet light, said matrix and lead silicate having substantially same indices of refraction whereby film is transparent. No. 2,194,629. The Sherwin-Williams Company.

Method perfuming sponge rubber by placing several crops raw flower oil on interior of rubber and sealing flower oil within rubber. No. 2,194,649. Albert C. Fischer.

Method of producing a food product having a high lactic acid, enzyme, and vitamin content. No. 2,194,672. Clarence M. Porter, Leroy V. Porter and Edward R. Hurlock.

Silver animal mucin and process for producing same. No. 2,194,677. Herman J. Schneiderwirth.

Method treating diatomaceous earth to render particles water repellent. No. 2,194,683. Johns-Manville Corp.

Transparent ice formed of water containing H Cl in amount to impart non-cracking characteristics to said ice. Frozen flesh foods glazed with above said transparent ice. No. 2,194,684. Robert Henry Bedford.

Production of fibers from glass, slag, and the like meltable materials. No. 2,194,727. Naamlooze Vennootschap Maatschappij tot Beheer en Exploitatie van Octrooien.

Method and apparatus for making ropes or cords from glass or slag. No. 2,194,728. Naamlooze Vennootschap Maatschappij tot Beheer en Exploitatie van Octrooien.

Composition of cementitious materials. No. 2,194,777. Dewey Portland Cement Company.

A heat absorbing glass containing at least .2% ferrous oxide, at least 25% phosphoric and boric acids and at least 1% reducible oxides. No. 2,194,784. Jenaer Glaswerk Schott & Gen.

Process of chemical ink or stain erasure from sized papers. No. 2,194,907. The Carter's Ink Company.

Improvement in process of news printing. No. 2,194,911. Interchemical Corporation.

Substantially water free insecticidal spray. No. 2,194,924. The Dow Chemical Co.

Aqueous dispersion of polymerized hydrocarbon material and method of preparing the same. No. 2,194,958. American Anode, Inc.

Preparation made from natural silk for application to the skin. No. 2,194,858. Reginald Wyatt Lawson.

Stabilization of photographic emulsions. No. 2,195,150. Ilford Limited.

Process for the manufacture of drying oil from castor oil. No. 2,195,225. Naamlooze Vennootschap Industreele Maatschappij Voorheen Noury & Van Der Lande.

Process for the manufacture of artificial leather and parchment and products obtained thereby. No. 2,195,239. Lucien Marie Charles Champsaur

Composition of matter in nature of cement. No. 2,195,248. Robert C. Hills.

Electrically insulating material comprising fragments of mica bonded together with a cementing agent comprising a polyvinylal resin. No. 2,195,254. General Electric Company.

In filtering material, a nodulated mineral wool mixed with a casein binder. No. 2,195,272. General Motors Corp.

Method of and means of preserving wooden piles. No. 2,195,275. Thorwald H. Hansen.

Luminescent material emissive in the yellowish-white spectral range. No. 2,195,341. General Electric Company.

Plaster of Paris cast and material for use in making same. No. 2,195,342. The Kendall Company.

Method preparing artificial magnesite refractory. No. 2,195,367. Charles Hart.

Coal Tar Chemicals

Pyrimidine compound. No. 2,194,190. Research Corporation.

Tetrahydroquinoline derivative. No. 2,194,399. General Aniline & Film Corp.

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Production naphthalene from alkyl naphthalenes, comprises contacting alkyl naphthalenes with clay catalyst at 450-650° C. No. 2,194,449. Socony-Vacuum Oil Company, Inc.

Symmetrical di-hydroalkylated aminoarsenobenzenes, yellow powder soluble in water, insoluble in ethyl alcohol and ether. No. 2,191,740. Winthrop Chemical Company.

Process of coupling two molecular proportions of a 1-(amino-phenyl)-5-pyrazolone carboxylic acid to one molecular proportion of a fully diazotized compound. No. 2,191,800. E. I. du Pont de Nemours & Co.

Ortho-hydroxy carboxylic acids. No. 2,193,677. General Aniline & Film Corp.

Method manufacturing oxalic and other acids comprises catalytic oxidation of carboniferous material. No. 2,193,337. Imperial Chemical Industries, Ltd.

Benzene carboxylic acids alkylated in the nucleus and process of preparing them. No. 2,195,198. I. G. Farbenindustrie Aktiengesellschaft.

Coatings

Coating composition resistant to yellowing in the film upon aging, comprises oil modified polyhydric alcohol-polybasic acid resin and a pigment. No. 2,191,947. E. I. du Pont de Nemours & Co.

Coating composition comprising tough and strong artificial resin resulting from conjoint polymerization of a vinyl halide with vinyl ester of lower aliphatic acid. No. 2,192,583. Commercial Solvents Corp.

Greaseproof coating compound consisting of evaporated and solidified products of zein 100 parts; 92% ethyl alcohol 300 parts; urea 10-25 parts; and glycol in amount equal to urea. No. 2,194,337. Corn Products Refining Company.

Dyes, Stains, etc.

Polyazo dye compounds. No. 2,191,801. E. I. du Pont de Nemours & Co.

Aza dyestuff, dye animal fibers various shades of good fastness properties. No. 2,191,823. General Aniline & Film Corp.

Acid diamino-triphenyl-methane dyestuffs. No. 2,192,118. General Aniline & Film Corp.

Production fast dyeing on cellulosic material. No. 2,192,127. General Aniline & Film Corp.

Azo dyestuffs. No. 2,192,153. General Aniline & Film Corp.

Method making generally spherical relatively minute aggregates of carbon black. No. 21,379. Herman Jacob Glaxner, deceased, by Columbian Carbon Co.

Azo dyestuff. No. 2,192,271. Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nort Reunes.

Azo compounds and process for coloring therewith. No. 2,193,037. Eastman Kodak Company.

Acid wool dyestuffs of the anthraquinone series. No. 2,193,151. General Aniline & Film Corp.

Copper containing azo dyestuffs. No. 2,193,228. General Aniline & Film Corporation.

Azo dyestuffs, soluble in water, dyeing vegetable fibers, regenerated cellulose and silk red shades. No. 2,193,438. General Aniline & Film Corp.

Insoluble azo dye containing aromatic nucleus of the diphenyl series. No. 2,193,553. E. I. du Pont de Nemours & Co.

Dyestuff intermediates; dry, stable, non-hygroscopic powder free from caustic alkali. Nos. 2,193,556-57. John W. Leitch & Company, Ltd.

Water-insoluble azo dyestuffs. No. 2,193,676. General Aniline & Film Corp.

Ortho-hydroxy disazo dyestuffs and their manufacture. No. 2,193,729. J. R. Geigy A. G.

Process for producing prints and dyeing with ester salts of leuco vat dyestuffs. No. 2,193,749. Durand & Huguenin, S. A.

Dyestuff mixtures and process for producing fast gray and black prints. No. 2,193,751. Society of Chemical Industry.

Reissue. Dispersible vat dye powder, dye particles being individually coated with a hydrophilic autodispersibility producing "protective agent." No. 21,402. American Cyanamid Co.

A dye intermediate. No. 2,193,996. E. I. du Pont de Nemours & Co.

Water-insoluble azo dyestuff. No. 2,193,997. E. I. du Pont de Nemours & Co.

Symmetrical cyanine dyestuff. No. 2,194,213. General Aniline & Film Corporation.

N-dihydro-azine compounds of anthroquinone series and process of preparation. No. 2,191,855. General Aniline & Film Corp.

Complex trivalent metal compounds of polyazo dyestuffs of the general formula. A_1-N=N-B-N-A_2 wherein A_1 and A_2 represent radicals of sulfonic acid of pyrazolone series and B a diphenyl dicarboxylic acid bearing the carboxyl groups in ortho-position to the azo groups. No. 2,194,857. General Aniline & Film Corp.

A system for dyeing cotton and woolen yarns or for treating such yarns with other liquids or fluids. No. 2,194,877. Louis Renault.

Monoazo dye consisting of radical of a diazotized dinitro-amino-benzotrifluoride in which nitro and trifluoromethyl groups are in meta positions to each other, said radical being connected with radical of an azo dye coupling component by an azo bridge. No. 2,194,927. E. I. du Pont de Nemours & Co.

Process for the manufacture of water-insoluble dyestuffs and products obtained therefrom. No. 2,195,011. Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Reunes.

Wool dyestuffs of the anthraquinone series. No. 2,195,067. General Aniline & Film Corp.

Polyazo dyestuffs. No. 2,195,089. General Aniline & Film Corp.

Azo dyestuffs and fiber dyed therewith. No. 2,195,390. George Holland Ellis and Henry Charles Olpin.

Equipment and Apparatus

Bottle stopper for storing sterile liquids. No. 2,191,495. Baxter Laboratories, Inc.

Humidity compensated thermostat. No. 2,191,630. General Motors Corp.

In manufacture of heat exchangers the method of brazing end portions. No. 2,191,631. General Motors Corp.

Steam purifying apparatus. No. 2,191,671. Riley Stoker Corp.

Pressure control valve. No. 2,191,726. Alva G. Blanchard.

Agitating, aerating and for mixing machine. No. 2,191,739. American Cyanamid Company.

Apparatus for separation of solid materials of different specific gravities by sink-and-float method. No. 2,191,805. Huntington, Heberlein & Company, Ltd.

Apparatus for applying liquid sizing material to abrasive coated web. No. 2,191,827. The Carborundum Company.

Fluid Control valve. No. 2,191,863. Philip Keith Saunders.

Method and means for cooling liquids. No. 2,191,864. Henry G. Schaefer.

Plastic extrusion molding machine. No. 2,191,882. The Hydraulic Press Corp., Inc.

Improvement in apparatus for countercurrent treatment of substantially immiscible liquids of different specific gravities. No. 2,191,919. Sinclair Refining Company.

Cooling tower in heat exchange apparatus. No. 2,191,938. Leon T. Mart.

Apparatus comprising in combination a gas main for conveying combustible gas containing condensable constituents and means for preventing deposition of said constituents. No. 2,192,011. Karl Koller.

An evaporator. No. 2,192,089. Sam Long.

Apparatus for treating a liquid with one or more other liquids of different density includes mixing vessel, means for charging and withdrawing, means for creating back pressure, etc. No. 2,192,094. Harold Moore.

Improved apparatus for chemical gas-liquid contact reactions. No. 2,192,124. E. I. du Pont de Nemours & Co.

Temperature control system for use in heating system. No. 2,192,144. Minneapolis, Honeywell Regulator Co.

In system for controlling flow of liquid, a closed tank having inlet and outlet check valves associated therewith. No. 2,192,200. Christie Tufts Page.

Cracking process and apparatus. No. 2,192,214. Horace M. Weir.

Apparatus and method for heat treating a plurality of hydrocarbon streams. No. 2,192,238. Cecilio L. Ocon.

Improvement in apparatus and method for cleaning gases by electrical means. No. 2,192,249. Research Corporation.

Apparatus for temperature control. No. 2,192,276. Carl A. Schaefer.

Pump for chemical materials. No. 2,192,325. Reuben L. Nelson.

Closure of heat exchangers. No. 2,192,328. The Griscom-Russell Company.

Apparatus for the treatment and storage of food. No. 2,192,348. Westinghouse Electric & Manufacturing Co.

Cathode ray tube titration apparatus. No. 2,192,777. The G. Frederick Smith Chemical Co.

Gas generating apparatus for manufacture of combustible gas. No. 2,192,815. Combustion Utilities Corporation.

Multichamber filter press. No. 2,192,868. Edwin William Malkin, assignor of ½ to The Manor Engineering Company, Ltd.

Water distilling apparatus. No. 2,192,879. Edwin H. Vail.

Method making glass-to-metal seal for use in electrical apparatus. No. 2,192,892. Friedrich H. A. Brandt.

Heat responsive device. No. 2,192,960. Radio Corporation of America.

Lower brickwork structure in cake oven battery. No. 2,193,000. Societe Generale de Fours a Coke, Systemes Lecocq.

Mixing apparatus. Nos. 2,193,001-2-3-4-5. Samu-El Ish- Shalom.

Method of and means for manufacturing pipes of fibrocement and the like from preformed sheet material. No. 2,193,040. William Alfred Porter.

Burner for liquid fuels. No. 2,193,085. Charles Beetschen.

Temperature control apparatus. No. 2,193,185. Anthony Winther, Martin P. Winther, and Mark Kindt.

Apparatus and process for irradiating fluids. No. 2,193,225. Cherry-Burrell Corporation.

Closure for containers. No. 2,193,227. Cherry-Burrell Corp.

Apparatus for effecting the separation of commingled liquids. No. 2,193,261. Homer G. Thomson.

Combination atomizer and mixer. No. 2,193,270. The Coleman Lamp and Stove Company.

Means for regulating temperature. No. 2,193,295. Johnson Service Company.

Photoelectric colorimeter. No. 2,193,315. Kenneth A. Evelyn.

Heat exchange apparatus. No. 2,193,345. Aktiebolaget Rosenblads Patenter.

Absorption refrigeration system. No. 2,193,389. The Bryant Heater Company.

Plastic Molding Machine. No. 2,193,395. Charles S. Dewey, Jr.

Plate-type heat exchanger. No. 2,193,405. The Aluminum Plant & Vessel Company, Ltd.

A coke oven. No. 2,193,456. Otto Hellman.

Method and apparatus for handling exposed film sheet in photoengraving work. No. 2,193,457. John H. Hogan.

Submersible electric motor. No. 2,193,463. U. S. Electrical Motors, Inc.

Multiple effect evaporator and the like. No. 2,193,483. Whiting Corporation.

Absorption refrigerating machine. No. 2,193,535. Maiuri Refrigeration Patents, Ltd.

Methods and apparatus for drying H_2O-containing fluids which are substantially inert to NaOH. Nos. 2,193,569-570. Westvaco Chlorine Products Corp.

A thermostat. No. 2,193,588. James W. Galloway.

Device for accelerating electrons to very high velocities. No. 2,193,602. Westinghouse Electric & Manufacturing Co.

Current conversion system. No. 2,193,604. Westinghouse Electric & Manufacturing Co.

Glass to metal seal by means of a vitreous material. No. 2,193,640. General Electric Company.

Apparatus for electrolytic protection of vessels. No. 2,193,667. Woldemar A. Bary.

Method and apparatus for separating solid materials from a liquid suspension. No. 2,193,706. Battelle Memorial Institute.

Flow measurement apparatus. No. 2,193,762. Louis De Florez.

As means for inhibiting local action, a negative plate for storage battery having composite grid with entire external surface of pure lead and interior of Pb-Sb alloy. No. 2,193,782. The Electric Storage Battery Co.

Method of and apparatus for forming and conditioning saponified products. No. 2,193,786. Refining, Inc.

Reissue. Apparatus and process for producing homogeneous ice cream, sherbet. No. 21,406. The Girdler Corp.

High duty steam generator particularly for high pressure. No. 2,193,795. Walter Bradtschneider.

Apparatus for effecting chemical reactions. No. 2,193,816. Houdry Process Corporation.

Method of producing molded concrete products and apparatus therefor. No. 2,193,847. John B. Pierce Foundation, N. Y.

Method of and apparatus for impregnating fibrous material. No. 2,193,861. Daniel J. Crowley.

Process and apparatus for bactericidal treatment. No. 2,193,908. Ralph H. Reiter.

Aerating agitator. No. 2,193,934. The J. H. Day Company.

Apparatus and process of washing comprises reciprocating and turning mineral matter beneath concentrated sprays of water of high velocity. No. 2,193,957. Delaware Chemical Engineering and Development Company.

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Apparatus for operating an oil well. No. 2,194,017. Virgil H. Gilliland and John James Graham assignors of 1-5 to T. F. Green, Jr.

Aerating device for liquids. No. 2,194,037. Charles H. Thuma, assignor of ½ to Seth L. Way.

Method and apparatus of washing bed of granular filtering material. No. 2,194,071. Eric W. Bacharach.

Food processing vessels. Nos. 2,194,117-8. Maurice H. Graham.

Apparatus for separating water and salt from steam by electrical means. No. 2,194,151. Wilhelm Rieger and Otto H. Hartmann.

Excess pressure releasing device. No. 2,194,159. E. I. du Pont de Nemours & Co.

Apparatus for conducting chemical reactions including means for introducing reactants and withdrawing products. No. 2,194,250. Interchemical Corporation.

Non-corrosive insert seat for valve. No. 2,194,266. Cameron Iron Works.

Control device for maintaining predetermined maximum level in distillation apparatus. No. 2,194,351. Imperial Chemical Industries, Ltd.

Horizontal regenerative coke oven battery. No. 2,194,404. Fuel Refining Corporation.

Gas collecting device in fused salt electrolytic cell. No. 2,194,444. E. I. du Pont de Nemours & Co.

Method for sterilizing empty vessels and apparatus therefor. No. 2,194,463. R. Powley & Sons, Ltd.

Apparatus for applying material such as powder or flock. No. 2,194,-487. Spray Engineering Company.

Device for monitoring a mixture of gases consisting of N_2 and CO_2, means for maintaining said sensitive filament at optimum temp. and means responsive in case of failure of said filament. No. 2,194,520. William A. Darrah.

Apparatus for determining the lubricating values of oils. No. 2,194,-527. The Automatic Appliance Company.

Piezoelectric crystal impedance element. No. 2,194,539. Bell Telephone Laboratories.

Apparatus for use in the cutting of plastic sheeting. No. 2,194,570. Libby-Owens-Ford Glass Company.

Extrusion apparatus for operation of high pressures for preparation of tubular bodies of gunpowder. No. 2,194,589. Alfonz Kunz.

Apparatus for indicating viscosity. No. 2,194,605. The Automatic Appliance Company.

Charging device for sintering apparatus. No. 2,194,626. American Lurgi Corp.

Apparatus for the production of gas. No. 2,194,630. H. A. Brassert & Company.

Apparatus for liquefying gases. No. 2,194,654. Paul Hadamovsky.

Apparatus for continuous nitration of aromatic hydrocarbons. No. 2,194,666. Josef Meissner.

Apparatus for recovering petroleum product ordinarily lost by evaporation. No. 2,194,680. George Gordon.

Apparatus for continuous selective gaseous solvent medium extraction and fractionation of materials possessing liquidity at operating temp. of the process. No. 2,194,708. Henry W. F. Lorenz.

A cooling tower. No. 2,194,711. The Fluor Corporation, Ltd.

In device for tempering glass sheets means for supporting sheet, and means located on opposite sides of sheet throughout the area for applying to the sheet first a heating gaseous fluid and thereafter a cooling gaseous fluid. No. 2,194,760. The American Security Company.

Portable compact unit for purifying water. No. 2,194,781. Orrin E. Andrus.

A steam trap. No. 2,194,946. Werner Kunstorff.

Bimetallic thermostats. Nos. 2,194,999-001. Westinghouse Electric & Mfg. Co.

Means for coloring and agitating paint. No. 2,195,234. Frank H. Brown.

Apparatus for continuous digesting of starch-containing raw materials or the like. No. 2,195,335. Alexander Loginow.

Process cutting metal with jet of oxygen. No. 2,195,384. Linde Air Products Co.

Explosives

Gelatinized high explosive compositions. No. 2,194,544. E. I. du Pont de Nemours & Co.

Fine Chemicals

Thiazone-3,5-dicarboxylic acids. No. 2,191,452. Sharp & Dohme, Inc.

Apparatus for production calcium sulfite. No. 2;191,467. West Virginia Pulp & Paper Company.

Process refining hydrocarbons. No. 2,191,510. Whitehurst Research Corporation.

Manufacture polyamides. No. 2,191,556. E. I. du Pont de Nemours & Co.

Preparation magnesium hydroxide in crystalline form. No. 2,191,560. Morton Salt Company.

Recovery usable values from brines containing chlorides of sodium, magnesium and calcium. No. 2,191,561. Morton Salt Company.

Hydroxythioether of general formula $R\text{-}S\text{-}R_1$, where R is terpenic radical and R_1 is alkyl radical containing at least one hydroxy group. No. 2,191,564. Society of Chemical Industry in Basle.

Continuous electrolytic production of alkali metal bromates. No. 2,191,574. Morton Salt Company.

Water-soluble 3,5,6,-trihydroxy and rostane and pregnane compounds. No. 2,191,576. Society of Chemical Industry in Basle.

Production of chemical product comprises condensing a mercaptoarylthiazole. No. 2,191,657. Monsanto Chemical Co., St. Louis.

Quaternary methallyl ammonium halides. No. 2,191,922. Rohm & Haas.

Quaternary nitrogen compounds and process of preparing them. No. 2,191,978. I. G. Farbenindustrie Aktiengesellschaft.

Preparation 2-substituted acrylic acids. No. 2,192,142. Rohm & Haas Company.

Preparation carbon compounds containing fluorine by use of mercuric fluoride. No. 2,192,143. Kinetic Chemicals, Inc.

Dinitro-alkyl-phenol. No. 2,192,197. The Dow Chemical Company.

Process for the production of salts of B-methyl choline and acyl derivatives thereof. No. 2,192,204. Merck and Company.

Process for manufacture anhydrides of lower fatty acids. No. 2,192,-259. Henry Dreyfus.

Production of levulinic and homologous acids and intermediate compounds from dihalogen butenes. No. 2,192,298. E. I. du Pont de Nemours & Co.

Dinitro-3,5-benzoate of chloro-2-hydroxy-4-butene-2. No. 2,192,299. E. I. du Pont de Nemours & Co.

Production high molecular weight heteropolymers of So_2 and olefins comprises reacting So_2 with an olefin in presence of small quantity of an oxide of nitrogen. No. 2,192,466. Phillips Petroleum Company.

Process forming high molecular weight heteropolymeric products comprises reacting So_2 with diallyl. No. 2,192,467. Phillips Petroleum Co.

Process of producing phenolphthalein. No. 2,192,485. Ex Lax, Inc.

Derivatives of 4-aminobenzenesulfonamides and process for the manufacture of same. No. 2,192,490. Hoffmann-La Roche, Inc.

In preparation of 3-chloro-cymene, step consisting of heating 2-bromo-5-chloro-cymene with zinc in presence of alcoholic solution of alkali metal hydroxide at reaction temp. below that at which decomposition takes place. No. 2,192,613. The Dow Chemical Co.

Tetra-isobutyl phenol sulfonic acid-detergent aids. No. 2,192,689. Standard Oil Development Company.

4-nicotinylaminobenzenesulfonamide, therapeutic agent. No. 2,192,828. Research Corporation.

Method of preparing quinuclidine and derivatives thereof. No. 2,192,-840. Valdo Prelog.

B-alkylcholine salts and their acyl esters. No. 2,192,925. Merck & Co.

Citrates of procaine and method for their production. No. 2,193,165. David Curtis.

Liquid ester reaction product of member of group consisting of P Cl_3 and PO Cl_3, and hexyl substituted phenol. No. 2,193,252. Monsanto Chemical Co., St. Louis.

Production ethylene trithiocarbonate, comprises reacting ethylene dichloride with carbon disulfide in presence of an alkali and water. No. 2,193,415. Shell Development Company.

Phenyl mercury oxyphenol and a process of making it. No. 2,193,430. Fahlberg-List Aktiengesellschaft Chemische Fabriken.

An N-aryl-glucamine which is devoid of nitro groups. No. 2,193,433. E. I. du Pont de Nemours & Co.

Production glutaric acid from cyclopentanol and nitric acid in continuous process. No. 2,193,562. Shell Development Company.

Manufacture of thiazole derivatives. No. 2,193,626. Monsanto Chemical Co., St. Louis, Mo.

Arylamide. No. 2,193,678. General Aniline & Film Corp.

Preparation pentachlorostyrene comprises passing chlorine gas into liquid ethylpentachlorobenzene at temp. 60-200° C. until one Cl has been introduced per mol of ethylpentachlorbenene, and then heating in excess of 300° C. No. 2,193,823. E. I. du Pont de Nemours & Co.

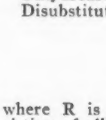
Lecithin compound comprising lecithin dissolved in ethyl lactate. No. 2,193,873. Stroud Jordan.

Process obtaining sodium citrate penatahydrate by evaporating aqueous sodium citrate soln. under abs. pres. less than 2.6" Hg. at temp. not above 46° C. No. 2,193,904. California Fruit Growers Exchange.

Diazonium compound having one hydroxy group high stability in air and soluble in water. No. 2,193,998. E. I. du Pont de Nemours & Co.

Dihydroaromatic cyanamides. No. 2,194,075. American Cyanamid Co.

Disubstituted cyanamide of formula



where R is hydroaromatic and radical and R′ radical from group consisting of alkyl, and aralkyl radicals. No. 2,194,076. American Cyanamid Co.

Disubstituted cyanamide of formula

where R is terpenyl radical and R′ radical from group consisting of alkyl, aryl and aralkyl radicals. No. 2,194,077. American Cyanamid Company.

C-cyclohexyl-diphenylamines and process for making them. No. 2,194,-079. The Dow Chemical Co.

As new composition of matter a colored substantially neutral organic compound. No. 2,194,201. Edgar I. Emerson.

Production Δ 4,5-androstene-dione from Δ 4,5-dehydroandrosterone. No. 2,194,235.

Preparation of N-substituted alkylol amines. No. 2,194,294. E. I. du Pont de Nemours & Co.

Process obtaining mixture of leucine and tyrosine substantially free of other amino acids. No. 2,194,302. Corn Products Refining Company.

Hydrogenation of propiolic acid and its salts. No. 2,194,362. E. I. du Pont de Nemours & Co.

Preparation of propiolic acid and its homologues. No. 2,194,363. E. I. du Pont de Nemours & Co.

Process of producing tetra-acetals of glyoxal and products thereof. No. 2,194,405. Research Corporation.

Polymeric 1-Furylbutadienes-1,3. No. 2,194,416. I. G. Farbenindustrie Aktiengesellschaft.

Liquid polymer of 1,4-dihydronaphthalene having M. W. of about 250-320. No. 2,194,450. E. I. du Pont de Nemours & Co.

As medicinal compound having anaesthetic properties, the ester of an aminopyridine carboxylic acid. No. 2,194,567. Pyridium Corporation.

Manufacture benzidine hydrochloride from nitrobenzene by use of nickel catalyst. No. 2,194,938. E. I. du Pont de Nemours & Co.

Process for the manufacture of guanidinic derivatives. No. 2,195,073. Montecatini Societa Generale per l'Industria Mineraria e Chimica.

2- and 2:7-di-alkylarylcarbamylfluorenes and fluorene-2- and a:7 dicarboxylic acids and a process of making them. No. 2,195,289. Imperial Chemical Industries, Ltd.

Esters of flacourtiacea alcohols. No. 2,195,345. Ozren Stefanovic and Georg Stefanovic.

An unsaturated furoate. No. 2,195,382. The Dow Chemical Co.

Cycloalkylated diaryl ether in which alicyclic substituent contains 6 C atoms in a saturated ring. No. 2,195,383. The Dow Chemical Co.

Unsaturated ethers of dioxan. No. 2,195,386. The Dow Chemical Co.

Industrial Chemicals

Reissue. Process for dehydrogenation aliphatic long chain primary alcohol to corresponding aldehyde by use of catalyst at elevated temp. and pres. No. 21,373. E. I. du Pont de Nemours & Co.

Method improving color of naphthenic acids by distilling with certain alloy equipment. No. 2,191,449. Union Oil Company of California.

Process extracting fat or oil from oleaginous material of nonmineral origin. No. 2,191,455. Arthur L. Davis and Louis H. Bartlett.

Petroleum wax alkylated phenol and process for making same. No. 2,191,499. Socony Vacuum Oil Co., Inc.

Preparation polymeric lower alkyl esters of acrylic acid in granular form. No. 2,191,520. Imperial Chemical Industries, Ltd.

Process reactivating absorbent bauxite contaminated with organic deposits, utilizes oxidizing atmosphere at temperature 1200° F.-1800° F. No. 2,191,592. Floridin Company.

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Basic Triarylmethane dyes. No. 2,191,674. General Aniline & Film Corp.

High-molecular polycarboxylic acid amides and their production. No. 2,191,738. I. G. Farbenindustrie Aktiengesellschaft.

Preparation sulphamic acid comprises reacting urea with 20-28% oleum to. No. 2,191,754. E. I. du Pont de Nemours & Co.

Continuous process for manufacture adipic acid. No. 2,191,786. Albert M. Aranow, assignor 1/5 to C. A. Miketta.

Method and apparatus for voltolization of oily organic compounds. No. 2,191,787. Standard Oil Development Company.

Production substances having tanning action comprises treating sulfonic acid of polynuclear aromatic hydrocarbon with urea and formaldehyde and improving water-solubility of resulting product by action of aromatic sulfonic acid and formaldehyde. No. 2,191,818. Rohm & Haas Company.

Manufacture 2-nitronaphthalene-4,8-disulfonic acid, in which 1,5-naphthalenedisulfonic acid is subjected to anhydrous nitration. No. 2,191,820. Montecatini Societa Generale per l'Industria Mineraria e Chimica.

In manufacture diphenylol-propane by reacting phenol with acetone, step of carrying reaction out in substantial absence of solvents and employing anhydrous HCl to promote reaction. No. 2,191,831. The Dow Chemical Co.

Biguanidino substitute diphenyloxides, insoluble in water, insoluble in organic solvents. No. 2,191,860. Winthrop Chemical Co., Inc.

Diethus of dimethylol urea and process for making same. No. 2,191,974. E. I. du Pont de Nemours & Co.

Denatured alcohols. Nos. 2,192,119-120. E. I. du Pont de Nemours & Co.

Denatured ethyl alcohols. Nos. 2,192,136-37. E. I. du Pont de Nemours & Co.

In process for extracting copper from alkaline solution, step of adding iron salt, drawing off copper containing iron slime deposit. No. 2,192,154. American Bemberg Corp.

Method removing propane from solution of viscous lubricating oil stock. No. 2,192,253. Standard Oil Company, Corp. of Ind.

Method preparing organic acids. No. 2,192,288. William J. Hale.

Production of concentrated sulfur dioxide. No. 2,192,461. American Lurgi Corporation.

Process dehydrating aqueous organic compound containing an organic impurity which vaporizes during azeotropic dehydration. No. 2,192,489. Shell Development Company.

Ammonolysis of secondary and tertiary amines. No. 2,192,523. The Sharples Solvents Corp.

Process rendering residual sulfuric acid-containing liquor from titanium hydrolysis and titanium oxide precipitation useful for calcium sulfate and titanium pigment production. No. 2,192,687. E. I. du Pont de Nemours & Co.

Improved lubricant comprising hydrocarbon oil and an added organic sulfur compound prepared by reacting halogenated compound having aliphatic chain with a sulfide so as to replace halogen with sulfur. No. 2,192,700. Standard Oil Development Company.

In preparation of salt of sulfuric acid derivative of fatty acid diester of a glycol, the improvement comprising carrying out treatment in alcoholic reaction medium wherein the alcohol is water-miscible. No. 2,192,721. National Aniline & Chemical Company.

Method preheating ammonia oxidation catalyst of gauze type comprises applying radiant heat to refractory material, passing air alone in contact with said refractory material to heat same, then passing heated air through the catalyst. No. 2,192,816. American Cyanamid Company.

Diamides of aliphatic sulpho- and sulphato-dicarboxylic acids and process of preparing them. No. 2,192,906. E. I. du Pont de Nemours & Co.

Esters of polycyclic alcohols and a method of producing the same. No. 2,192,935. Schering Corporation.

Industrial ethyl alcohol denatured with .5-5 parts monochlorobenzene per 100 parts 95% C_2H_5OH. No. 2,193,024. Eastman Kodak Company.

Industrial ethyl alcohol denatured with .5-5 parts diamylene per 100 parts 95% C_2H_5OH. No. 2,193,025. Eastman Kodak Company.

Process for catalytic oxidation of organic sulfur compounds in combustible gases. No. 2,193,278. The Gas Light & Coke Company.

Preparation water soluble hyposulfites. No. 2,193,323. I. G. Farbenindustrie Aktiengesellschaft.

Products obtained by hydrogenating aliphatic saturated hydrocarbons substituted by at least three substituents of formula R-OH, where R is aromatic hydrocarbon radical. No. 2,193,327. I. G. Farbenindustrie Aktiengesellschaft.

Method fractionally condensing mixed vapors and separating condensate into different constituent parts. No. 2,193,460. Jean Loumiet et Lavegne.

Method for manufacturing alkyl phenols comprising alkylating in presence of Friedel-Craft Catalyst. No. 2,193,760. The Dow Chemical Co.

N-Methylsulphites and N-Methanesulphinic acid salts of 1-Aryl-2,3-Dialkyl-4-Alkylaminopyrazolones. No. 2,193,788. Winthrop Chemical Company, Inc.

Method crystallizing pure sodium carbonate heptahydrate from brines. No. 2,193,817. Frederic A. Dakin.

Preparation halogenated organic compounds, comprises treating (αaceto) κbutyrolactone with halogenating agent. No. 2,193,858. Edwin R. Buchman.

Alkylation products of aromatic compounds and a process of preparing them. No. 2,193,944. I. G. Farbenindustrie Aktiengesellschaft.

Sulfonium compounds. No. 2,193,963. Benjamin R. Harris.

Production ammonium carbamate comprises contacting non-gaseous CO_2 with liquid NH_3 under anhydrous conditions. No. 2,194,082. American Cyanamid Co.

Cativyl alcohol, alcohol alcohol corresponding to alcohol radical of principal ester constituent of cative resin. No. 2,194,121. Arthur D. Little, Inc.

Process treating finely-divided calcium carbonate material. No. 2,194,164. Holly Sugar Corporation.

Method making thiazole compounds comprises condensing with thioformamide a compound having formula $CH_3COCHXCH_2CH_2OR$, in which X is a halogen and R is an acid radical. No. 2,194,179. Research Corp.

Production chlorites of alkali metals and alkaline earth metals including. No. 2,194,194. The Mathieson Alkali Works, Inc.

Preparation synthetic product comprises polymerizing aqueous suspension of chloroprene and an unsaturated polymerizable organic compound in presence of emulsion stabilizer comprising partially saponified polyvinyl acetate. No. 2,194,350. Chemische Forschungsgesellschaft m.b.H.

Stabilization of liquid hydrocyanic acid by use of substance selected from group consisting of phosphoric acid and phosphorous pentoxide. No. 2,194,370. E. I. du Pont de Nemours & Co.

Manufacture compounds containing at least two cyclic amidine radicals. No. 2,194,419. I. G. Farbenindustrie A. G.

Process treating copper sulfate ore to separate sands from slimes. No. 2,194,454. William E. Greenwalt.

Nitriles of fully acetylated 2-keto sugar acids and process for their production. No. 2,194,476. Merck & Co., Inc.

Process removing silica from silica-containing water comprises mixing water with gelatinous aluminum hydrate, separating water and hydrate, and then treating latter with NaOH to regenerate its silica-absorbing power. No. 2,194,524. National Aluminate Corporation.

Composition of matter resulting from an esterification reaction between a certain amine and an acidic ester. Nos. 2,194,643-646. Petrolite Corp., Ltd.

In recovery of glycerin from aqueous glycerin-containing solution, the step of treating solution with substantially water-immiscible combination of solvents to extract the glycerin. No. 2,194,665. Speas Development Co.

Unsaturated ketones and process for producing them. No. 2,194,704. E. I. du Pont de Nemours & Co.

Salt consisting of polybasic phosphoric acid partly esterified with guaiacol and ammonia as the basic constituent. No. 2,194,724. Interpublic A.-G.

Recovery of protein from cottonseed. No. 2,194,835. Cotton Research Foundation.

Dehydration of organic liquids by azeotropic distillation. No. 2,194,851. Les Usines de Melle.

3-nitro-4 lower alkyl phenol wherein alkyl group has at least three carbon atoms. No. 2,194,923. E. R. Squibb & Sons.

Manufacture primary arylamines. No. 2,194,925. E. I. du Pont de Nemours & Co.

Mono-nitro-benzene compound and the manufacture thereof. No. 2,194,926. E. I. du Pont de Nemours & Co.

Solvents for the condensation products of polyvinyl alcohols and aldehydes. No. 2,194,994. Societe Nobel Francais.

Process of producing nitriles of cyclic compounds. No. 2,195,076. General Aniline & Film Corp.

Process preparing new sulfonation products comprises directly sulfonating a ketone. No. 2,195,088. I. G. Farbenindustrie Aktiengesellschaft.

Recovery of globulin from cottonseed. No. 2,194,867. Cotton Research Foundation.

Preparation alpha-sulfuric acid derivatives of saturated higher fatty acids comprises sulfonating a salt of saturated higher fatty acid with SO_3 in presence of liquid SO_2. No. 2,195,145. The Solvay Process Company.

Process for the production of sulfonated fatty acids. No. 2,195,186. The Solvay Process Company.

Production of sulfonation derivatives. Nos. 2,195,187-188. Solvay Process Company.

Process for production of acetylene by partial combustion of gases essentially comprising hydrocarbons which are not highly unsaturated. No. 2,195,227. I. G. Farbenindustrie Aktiengesellschaft.

Process for producing soap and recovering glycerin. No. 2,195,377. Refining, Inc.

Metals, Alloys

Hard alloy containing a metal of the iron group; chromium; metal from group composed of tungsten and molybdenum; one or more metals of the group composed of tantalum and columbium, and titanium and zirconium; and carbon. No. 2,191,446. Fansteel Metallurgical Corp.

Method of depositing alloy metal of predetermined analysis. No. 2,191,471. M. W. Kellogg Co.

Method forming integral alloy coating on steel base. No. 2,191,472. M. W. Kellogg Co.

Welding composition substantially free of substances productive of deleterious gas and vapor. No. 2,191,473. The M. W. Kellogg Co.

Manufacture composite metal articles. No. 2,191,474. M. W. Kellogg Co.

Manufacture alloy ingots having cast metal core surrounded by and united to protective worked metal shell of substantially same analysis. No. 2,191,475. M. W. Kellogg Co.

Apparatus for producing composite metal articles. No. 2,191,478. M. W. Kellogg Co.

Method producing dense, homogeneous alloy bodies characterized by freedom from casting defects. No. 2,191,479. M. W. Kellogg Co.

Method of coating ferrous metal with lead. No. 2,191,598. The Cleveland Graphite Bronze Company.

Alloy adopted to be welded directly upon a ferrous support. No. 2,191,666. The American Cutting Alloys, Inc.

Process for recovery of molybdenum from liquids containing same, comprises adjusting pH to 2.5-7.5, intimately contacting with lead sulfate, and mechanically separating solids. No. 2,191,794. I. F. Farbenindustrie Aktiengesellschaft.

Method for electrodeposition of nickel to obtain fine grained lustrous deposit. No. 2,191,813. The Udylite Corp.

Method fabricating articles from sponge iron. No. 2,199,936. General Motors Corp.

Method preventing corrosion of hard metal alloy bearings in presence of highly refined lubricating oils comprises adding an organic phosphorous compound. No. 2,191,996. Standard Oil Company, Corp. of Ind.

Method for improving magnetic properties of alloys consisting of nickel and iron by cold working, annealing and subjecting to magnetic field. No. 2,192,032. General Electric Company.

In device for spot testing of surfacing metals, an open-bottom chambered element, adapted for sealed application to a sheet of metal to be tested. No. 2,192,248. Granite City Steel Company.

Process treating surface of ferrous metal articles to impart black color. No. 2,192,280. Ernest A. Walen and Fowler W. Wilbur.

Silver solder alloy comprising 48-56% ag, 20-22% Cu, 16-22% Zn, 1-5% Sn, and 1-7% Cd. No. 2,192,455. American Platinum Wks.

Silver solder alloy same as above except there is 1-7% Sn and no Cd. No. 2,192,456. American Platinum Wks.

Process for preparing metal plate for lithographic printing. No. 2,192,482. Philip Schroeder, assignor of 1/6 to Lawrence J. Clark and 4/6 to Irvin J. Rossman.

Beryllium-copper alloys. No. 2,192,495. Heraeus-Vacuumschmelze, A. G.

Beryllium-copper alloys. No. 2,192,497. Heraeus-Vacuumschmelze, A. G.

A white cast iron including an alloying metal. No. 2,192,645. Link-Belt Company

Method of making a sintered alloy. No. 2,192,741. General Electric Company.

Sintered permanent magnet containing 5-20% Al, 10-45% metal from group consisting of nickel and cobalt, remainder iron. No. 2,192,743. General Electric Company.

Joining of aluminum parts to one another or to other metal parts. No. 2,192,751. General Electric Company.

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Method treating sheets of ferrous magnetic material. No. 2,192,756. General Electric Company.

Method of sintering and impregnating porous metal briquettes. No. 2,192,792. General Motors Corporation.

Method of lubricating special alloy bearings with ordinarily corrosive oil made non-corrosive by addition of a di-alkyl polysulfide having general formula R-S(S)n-S-R, where n is 1 or 2. No. 2,192,874. Gulf Oil Corporation.

Process recovering vanadium from vanadium bearing material containing phosphorous. No. 2,193,092. Anaconda Copper Mining Company.

Vanadium steel alloy. No. 2,193,222. Allegheny Steel Company.

Process in recovering micronic particles of gold and the like from rock and ore. No. 2,193,234. Micronic Gold Recoveries, Inc.

Composite metal body comprising steel backing and relatively thin facing of copper containing an element or elements more soluble in copper at high temp. than at low temp. No. 2,193,246. Clad Metals Industries, Inc.

Process for obtaining beryllium and beryllium alloy. No. 2,193,364. Perosa Corporation.

Process for producing hard metal carbide alloys. No. 2,193,413. Carl Ewsin and Joseph J. Haesler.

Uniting of finely divided iron with other metals. No. 2,193,435. William H. Smith, Kathryn L. Smith, administratrix of William H. Smith, deceased.

Process for the production of alloys of beryllium and copper. No. 2,193,482. The Beryllium Corporation.

Process desulfurizing pig iron. No. 2,193,593. Russell Pearce Heuer.

Process making substantially spherical shot for use in manufacture shotgun cartridges. No. 2,193,664. Remington Arms Co., Inc.

Substantially carbon-free ternary magnetic alloy. No. 2,193,768. The Kinzoku Zairyo Kenkyusho.

Apparatus for spot hardening sheet metal. No. 2,193,770. Thomas & Skinner Steel Products Company.

Method of making metallic ribbon. No. 2,193,856. Western Electric Company.

Apparatus for powdering metal. No. 2,194,026. U. S. Metal Powders, Inc.

Recovery of silver from waste hyposulphitic liquids. No. 2,194,056. Th. Muhlethaler S. A.

Low alloy steel. No. 2,194,178. Electro Metallurgical Company.

Process refining lead comprises adding alkaline earth metal, K O H, and sodium to molten lead containing bismuth and removing resulting dross. No. 2,194,441. E. I. du Pont de Nemours & Co.

Method and apparatus for handling molten metal. No. 2,194,453. Anaconda Wire & Cable Company.

Method of brightening metals electronegative to iron. No. 2,194,498. The Udylite Corporation.

Method reconditioning the metallurgical structure of metal by heat treatment. No. 2,194,909. Union Carbide & Carbon Corp.

Process for the manufacture of complex silicon alloys. No. 2,194,965. Societe d'Electrochimie, d'Electromatallurgie et des Acieries Electriques d'Ugine.

Apparatus for coating metal sheets. No. 2,194,974. John E. Elswick.

Physically and chemically resistant iron phosphorous alloy. No. 2,194,982. Roy Barnard McCauley.

Process of annealing hard iron for the production of malleable cast iron. No. 2,195,078. Surface Combustion Corp.

Process of reducing magnesium content of aluminum-base alloys. No. 2,195,217. U. S. Reduction Co.

Method and apparatus for making hot pressed hard metal compositions. No. 2,195,297. Carboloy Company, Inc.

Paper and Pulp

Method increasing retention of non-setting paper filler. No. 2,191,575. Howard D. Meincke.

Method of making paper. No. 2,192,488. S. D. Warren Company.

Fermentation process for the preparation of paper pulp from bagasses and similarly incrusted cellulose fibers. No. 2,193,493. Universal Cellulose (Proprietary) Ltd.

Method making antioxygenic paper and board. No. 2,193,695. Musher Foundation, Inc.

Petroleum

Process of dewaxing oils. No. 2,192,718. Standard Oil Development Company.

Process effecting rough division of composite vapor stream into higher and lower boiling parts without fractionation by cooling or partial condensation comprises selective absorption by porous contact material. No. 2,192,911. Houdry Process Corporation.

Lubricant comprising hydrocarbon oil and small quantity of a nitrothiophene to impart extreme pressure properties. No. 2,192,930. The Atlantic Refining Co.

Method producing lubricants comprising treatment of refined mineral oil with catalyst consisting of solution of caoutchouc in spirits of turpentine and a naphthenic acid. No. 2,192,976. The Richards Chemical Works, Inc.

Processes for breaking petroleum emulsions of the water-in-oil type. Nos. 2,192,993-4-5. Petrolite Corporation, Ltd.

Stabilized mineral oil composition. No. 2,193,331. Socony Vacuum Oil Company.

Process for removal of sulphuric acid compounds from hydrocarbon oils. No. 2,193,417. Shell Development Company.

Cutting oil composition comprising soft coumarone-indene resin of M.P. not higher than 80° C., containing substantial content of sulfur, and another oil having lubricating qualities. No. 2,193,476. Pennsylvania Industrial Chemical Corp.

Treatment of hydrocarbon oils. No. 2,193,625. Texaco Development Corporation.

Mineral oil composition and process of treating same. No. 2,193,666. Monsanto Chemical Company, St. Louis.

Process for purification of crude light oil. No. 2,193,763. Koppers Company.

Lubricating oil composition comprising petroleum lubricating oil and product resulting from heating together sperm oil, lanolin and sulfur to about 320-330° F. No. 2,193,771. Texaco Development Corp.

Process for conversion of higher boiling hydrocarbon oils into lower boiling oils. No. 2,193,772. Texaco Development Corp.

Process for conversion hydrocarbon oils comprises distilling crude petroleum in absence of substantially any cracked product to produce a reduced crude and virgin gas oil and then cracking and distilling to obtain gasoline. No. 2,193,776. Texaco Development Co.

Process for conversion of normally gaseous hydrocarbons to gasoline motor fuel, comprises use of heat under superatmospheric pressure and fractionation. No. 2,193,797. Process Management Company, Inc.

In hydrocarbon conversion process steps of separating certain classes of hydrocarbons from conversion products and subjecting same to polymerization. No. 2,193,798. Process Management Company, Inc.

In hydrocarbon conversion the process comprising separation of gaseous hydrocarbons into fraction predominating in C_3 hydrocarbons and another fraction predominating in higher boiling normally gaseous hydrocarbons, and then separately subjecting fractions to conversion reactions. No. 2,193,799. Process Management Company, Inc.

Process for catalytic dehydrogenation. No. 2,193,815. Standard Oil Company, corp. of Ind.

Process for countercurrent reaction of hydrocarbons with SO_2 and Cl_2. No. 2,193,824. E. I. du Pont de Nemours & Co.

Method fractionating crude wax into plurality of waxes of varying melting points. No. 2,194,185. Sun Oil Company.

Production by hydrogenation of valuable hydrocarbon products by catalytic treatment of combustible carbonaceous materials. No. 2,194,186. Standard I. G. Company.

Continuous process for purifying salt-impregnated crude oil. No. 2,194,269. John B. Rogerson.

Process treating normally fluid paraffin hydrocarbons comprises contacting the paraffins under dehydrogenating conditions with a catalyst. No. 2,194,280. Universal Oil Products Company.

Method preventing deterioration of refined mineral oils by adding .04% of product formed by condensing, with a Friedel-Craft catalyst, chlorinated paraffin wax with compound from group of naphthols and polyhydroxy benzenes. No. 2,194,312. Standard Oil Company, corp. of Ind.

Method refining hydrocarbon distillates comprises subjecting said distillates to sweetening action of a copper compound and then treating distillate with salt of ortho phosphoric acid to remove copper reaction products. No. 2,194,321. Universal Oil Products Company.

Process reforming straight chain paraffins boiling within the gasoline range by use of activated magnesite under subatmospheric pressure at temp. 1200-1500° F. for time not in excess of 4/100 of a second. No. 2,194,335. Universal Oil Products Company.

Improvement in process for obtaining valuable hydrocarbons in carbonization of bituminous fuels comprises method of increasing temp. No. 2,194,359. Koppers Company.

Art of heating hydrocarbons. No. 2,194,500. Sinclair Refining Company.

Process for producing gasoline and gas. No. 2,194,574. Fuel Research Development Corp.

Process of treating hydrocarbon oil. No. 2,194,692. Texaco Development Corp.

Method of increasing the combustibility of hydrocarbon fuels. No. 2,194,887. Rodolphe de Lamprecht.

Processes for dewaxing oils. Nos. 2,194,968-969. Union Oil Company of California.

Process extracting lubricating oil of Pennsylvania grade by use of selective solvents. No. 2,191,767. Pennsylvania Petroleum Research Corp.

Method recovering high quality lubricating oils from inferior lubricating oil stocks by cold fractionation, extraction, and synthesis. No. 2,191,972. Cecilio L. Ocon.

Process treating hydrocarbon fraction of gasoline motor fuel boiling range to convert gum forming constituent to bodies of higher boiling range and removing converted gum forming constituents. No. 2,192,174. Monsanto Chemical Co.

Method of preventing the formation of gumlike products in oil. No. 2,195,167. Alfred Charles Glyn.

Treatment of hydrocarbon oil. No. 2,195,265. Texaco Development Corp.

Pigments

Process for producing white titanium dioxide pigments of predetermined subordinate tints. No. 2,192,501. E. I. du Pont de Nemours & Company.

Preparation a phthalocyanine pigment in an improved physical condition. No. 2,192,704. E. I. du Pont de Nemours & Co.

Reissue. Process converting finely divided and dusty carbon black into agglomerated product substantially dustless. No. 21,390. United Carbon Company, Inc.

Pigment coating composition comprises pigment, binder selected from class consisting of drying oils, synthetic resins, and organic cellulose derivatives, and an aliphatic polyhydroxy amine. No. 2,192,953. E. I. du Pont de Nemours & Co.

Process transferring pigment from aqueous system to an organic vehicle immiscible with water. No. 2,192,954. E. I. du Pont de Nemours & Co.

Free flowing and non-livering pigmented composition. No. 2,192,955. E. I. du Pont de Nemours & Co.

Process comprising flocculating a water-wet pigment. No. 2,192,956. E. I. du Pont de Nemours & Co.

Cyclic process for production rutile pigment. No. 2,193,559. E. I. du Pont de Nemours & Co.

Production rutile pigment from barium titanate. No. 2,193,563. E. I. du Pont de Nemours & Co.

Method producing aluminum bronze powder of high covering power. No. 2,193,663. Aluminum Company of America.

Method of packing and storing carbon black. No. 2,194,392. Danciger Oil and Refineries, Inc.

Black organic pigment obtained by oxidizing compound included in group consisting of unsulfonated nigrosines and indulines with oxidizing agent of strength of Mn O_2 and HN O_3. No. 2,194,423. American Cyanamid Co.

White pigment composition comprising a sulfide, and a water soluble thiocyanate. No. 2,194,479. The Glidden Company.

Paint containing drying oil vehicle, said paint being modified by presence of a basic lead sulfate, having $PbO:PbSO_4$ ratio not lower than about 2:1 nor higher than 4:1. No. 2,194,526. E. I. du Pont de Nemours & Co.

Painting composition containing chlorinated paraffins, chlorinated rubber, water insoluble salt which does not give off oxygen when heated, a pigment and filler, and a volatile solvent. No. 2,194,690. Wm. E. Hooper & Sons Company.

Burner for production of carbon black. No. 2,194,980. William A. Knapp.

Light colored pigment comprising a sulfide and a cyanamide. No. 2,195,117. The Glidden Company.

Pigment composition consisting of a cadmium sulfide pigment and a water soluble thiocyanate. No. 2,195,118. The Glidden Company.

Digest of Patents on resins, plastics, rubber and textiles from *Gazettes* listed above will be given next month.

Foreign Chemical Patents
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Abstracts of Foreign Patents

By E. L. Luaces, Chemical Consultant

To assist those making use of this summary, it might be well to comment briefly on the system used by each of these countries in reporting patents.

Canada grants the patent on the date of publication. It does not print the patents, but supplies typewritten certified copies at a cost averaging about five dollars each.

English "patents" here reported are known as *Complete Specifications Accepted* and are open to opposition by interested parties for a period of two months from date of publication. Printed copies may be obtained at ls. ld. each.

French patents are granted several months before publication, and the printed report issued several days or even weeks after its date. Printed copies may be obtained at 10 francs each.

Belgian patents, like French, are granted long before publication. The report comes out 12 times each year, and photostatic copies can be obtained at from 3.50 to 4.50 francs per page.

In this digest the latest available data will be published, but it will be understood that some delay will occur as a result of present conditions in Europe. The German patents will be reported just as soon as we are sure of uninterrupted service.

We shall be glad to receive comments or criticisms.

BELGIAN PATENTS

Granted July 3 and 31, 1939; Published February 1, 1940.

Improvement in process for the production of yeast. No. 435,004. Arthur Guiness, Son & Company, Limited.

Improvement in the manufacture of briquettes with an agglutinant comprising a mixture of mixed bituminous hydrocarbons. No. 434,462. P. Friedrich.

Process for the concentration of ores and other minerals by decantation and flotation. No. 434,641. A. Pearson.

Process for separating from their water the schist or residues separated in flotation operations. No. 434,653. Westfalia Dinnendahl Groppel A. G.

Process for the concentration of ores by flotation. No. 434,709. B. Kalinowski.

Alloy comprising up to 28% Pb and up to 35% Cd and about 12% Ag, Bi, and/or Sn, the rest being Mg in the proportion of 65% as against 35% of the other elements; and use of this alloy for the manufacture of smooth bearings. No. 434,801. I. G. Farbenindustrie A. G.

Steel containing at least 50% Cr and Cb-T, less than 20% Si and less than 1% Cr; the ratio of Cb to Cr being between 1:20 and 20:1. No. 434,814. Electro Metallurgical Company.

Improvement in furnaces and processes for the vaporization of zinc. No. 434,816. International Smelting and Refining Company.

Alkaline nitrate fusion bath which will resist decomposition. No. 434,905. I. G. Farbenindustrie A. G.

Improvement in the recovery of gold and silver from ores. No. 434,984. A. E. Jeffrey and J. A. Neville.

Improvement in the protection of alloys rich in magnesium. No. 435,038. High Duty Alloys, Limited.

Process for preparation of steels and alloys low in carbon. No. 435,052. S. Westberg.

Furnaces for the vaporization of metals. No. 435,128. International Smelting and Refining Company.

Process for the preparation of aluminum. No. 435,189. I. J. Foundaminsky and H. Loevenstein.

Process for the manufacture of copper, very ductile and free from oxygen, and the product thus obtained. No. 435,203. Metallgesellschaft A. G.

Method of completing and correcting the electrolyte in the refining of aluminum by electrolysis. No. 435,236. Cie. de Produits Chimiques et Electrometallurgiques Alais, Froges et Camarque.

Process for depositing metallic films on substances such as glass. No. 434,863. C. Lorenz A. G.

Process for the treatment of raw materials for cement manufacture. No. 434,890. F. L. Smith & Co. A/S.

Improvements in the production of nitrocellulose products. No. 433,416. Sylvania Industrial Corporation.

Process for the regeneration of rubber and similar products. No. 434,136. H. Ghez and O. Ghez.

Improvements in the manufacture of polyhydric alcohols. No. 434,140. Imperial Chemical Industries, Limited.

Improvements in hydrogenation reactions. No. 434,161. Imperial Chemical Industries Limited.

Improvements in hydrogenation of organic substances. No. 434,216. Imperial Chemical Industries Limited.

Production of dispersion by dissolving ethylene polymers in an organic volatile solvent more or less miscible in water, emulsifying the solution in an aqueous medium in the presence of dispersing agents, and then driving out the solvent with heat. No. 434,497. Imperial Chemical Industries Limited.

Process for the preliminary treatment of metallic surfaces before covering them with phosphate films, comprising washing with an aqueous solution of oxalic acid or an equivalent acid. No. 434,645. I. G. Farbenindustrie A. G.

Process for the saccharification of starch comprising submitting an aqueous suspension to the action of hydrolizing enzymes and of catalytic co-enzymes for from 1-5 hours at 35-80° C. No. 434,668. Les Usines de Melle S. A.

Process for the manufacture of hard resins of high melting points. No. 434,677. I. G. Farbenindustrie A. G.

Mono-azo dyes and process of manufacture. No. 434,679. I. G. Farbenindustrie A. G.

Process for the preparation of new thiazol and benzothiazol compounds. No. 434,683. Société des Usines Chimiques Rhône-Poulenc.

Use of chlorinated rubber containing from 60-45%, and preferably from 55-50% of chlorine as binding agent between synthetic products similar to rubber and metallic surfaces to be lined. Usable also for glass, porcelain, etc. No. 434,695. Metallgesellschaft A. G.

Process and apparatus for sedimentation. No. 434,712. The Dorr Company, Inc.

Fire-proofing agents of the orthophosphoric acid and/or neutral sodium tungstate base type are improved by adding one or more of the following: ammonium tungstate and sulfate, sodium chloride, magnesium or zinc phosphate or sulfate, sal ammoniac, aluminum borate, hydrated alumina, borax, and salicilic acid. No. 434,721. R. Van Rolleghem.

Process for the production of organic compounds of sulfur. No. 434,734. I. G. Farbenindustrie A. G.

Mono-azo dyes and process of preparing them. No. 434,741. I. G. Farbenindustrie A. G.

Process for the preparation of progesterone by oxidizing cholesterone in sulfuric acid of more than 50%. No. 434,745. Chinoin, Gyogyszer es Vegyeszeti Termekek Gyara.

Process for producing anti-corrosion films on metal surfaces. No. 434,749. Société Continentale Parker.

Process for the manufacture of plastic matters such as films, filaments, linings, molded articles, etc., from inorganic gels. No. 434,760. Research Corporation.

Process for the preparation of a ferrous catalyst for the synthesis of gasoline. No. 434,772. G. I. Kita.

Process for introducing an inert gas under pressure into plastic synthetic resins until the pores have increased in size to a desired degree as a result of the gas injected. No. 434,774. Nouveautes Industrielles S. A.

Apparatus permitting the hydrogenation of hydrocarbons at high temperature and pressure. No. 434,781. Société Belge de l'Azote et des Produits Chimiques du Marly et Société Chimique de la Grande Paroisse.

Apparatus for the production of hydrocarbons by hydrogenation. No. 434,782. Société Belge de l'Azote et des Produits Chimiques du Marly *and* Société Chimique de la Grande Paroisse.

Hydrogenation under pressure of carbonaceous materials. No. 434,783. Société Belge de l'Azote et des Produits Chimiques du Marly *and* Société Chimique de la Grande Paroisse.

Hydrogenation apparatus for the production of valuable organic liquids. No. 434,784. Société Belge de l'Azote et des Produits Chimiques du Marly *and* Société Chimique de la Grande Paroisse.

Process for the production of valuable hydrocarbons by hydrogenation treatment of solid combustibles. No. 434,785. Société Belge de l'Azote et des Produits Chimiques du Marly *and* Société Chimique de la Grande Paroisse.

Process for the production of valuable hydrocarbons. No. 434,786. Société Belge de l'Azote et des Produits Chimiques du Marly *and* Société Chimique de la Grande Paroisse.

Method of treating solid and liquid combustibles in order to modify certain of their properties. No. 434,788. Société Belge de l'Azote et des Produits Chimiques du Marly *and* Société Chimique de la Grande Paroisse.

Process for the manufacture of polyanhydrides of amino acids of high molecular weight which may be transformed into molded articles. No. 434,794. I. G. Farbenindustrie A. G.

Improvements in the separation and recovery of solvents or hydrocarbons contained in gaseous mixtures. No. 434,812. Société des Etablissements Barbet S. A.

Amino-o-hydroxy-carboxylic acids of the diaril-methane series and process for their manufacture. No. 434,858. J. R. Geigy S. A.

Process for increasing the resistance to corrosion of light metal and light metal alloys by anodic treatment. No. 434,906. I. G. Farbenindustrie A. G.

Halogen substitution products of acylaminosulfonic acids and process for their preparation. No. 434,915. J. R. Geigy S. A.

Process and apparatus for refining non-volatile organic acids. No. 434,926. F. Blumenthal.

Process for the manufacture of sodium cyanide. No. 434,943. La Floridienne J. Buttgenbach & Co. (S. A.).

Improvement in process of cold vulcanization with sulfur chloride. No. 434,986. Societa Italiana Pirelli.

Process for the manufacture of titanium pigment. No. 435,008. E. I. du Pont de Nemours & Co., Inc.

Process for increasing the efficiency of drug extracts by carrying out

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the solvent extraction in the presence of acids such as phosphoric and/or formic. No. 435,012. Phytochimie, S. A.

Process for the manufacture of cellulose. No. 435,029. V. Schweickart.

Process and apparatus for the preparation of ammonium nitrate. No. 435,028. Hydro-Nitro S. A. *and* T. Hobler.

Process and products for the cleaning of textile materials and products. No. 435,053. R. Vierthaler.

Process for preparing dispersion of strongly polymerized organic matters. No. 435,076. I. G. Farbenindustrie A. G.

Process and apparatus for distilling shale, lignite, schist, etc. No. 435,085. H. du Saugey.

Process for the preparation of compounds of the cyclopentanopolyhydrophenanthrene series. No. 435,089. Schering A. G.

Mono-azo dyes and process of preparing them. No. 435,090. I. G. Farbenindustrie A. G.

Process for the obtainment of compounds of high bactericide power by neutralizing the phosphoric acid derivatives of 4-amino-benzene-sulfonamides with organic bases containing at least 4 atoms of carbon and 1 of nitrogen. No. 435,094. Produits Roche, S. A.

Process for preparing products of decomposition of sterols containing ketone groups by oxidizing sterols or sterol derivatives, such as cholestenone, with air or oxygen in the presence of catalyst. No. 435,098. Chinoin Cyogyszer es Vegyeszeti Termekek Gyara R. T.

Process for the production of artificial resins. No. 435,101. Oelwerke Noury & Vander Lande G.m.b.H.

Process for the obtainment of refined phenol from raw phenol. No. 435,149. I. G. Farbenindustrie A. G.

Process for the preparation of insulin compositions. No. 435,158. I. G. Farbenindustrie A. G.

Process for improving the heat resistance of articles of polyvinyl chloride or similar substances by treatment with a halogen in gas form or dissolved in an inert solvent. No. 435,159. I. G. Farbenindustrie A. G.

Process for the preparation of saturated and unsaturated aldehydes of the pregnane series. No. 435,169. Société pour l'Industrie Chimique à Basle.

Process for the preparation of new ester-salts of the oxystilbene series. No. 435,170. Société pour l'Industrie Chimique à Basle.

Process for the manufacture of diethylenediamine. No. 435,180. Scott & Bowne, Spolka Akcyjna, Towarzystwo Przemyslowo-Handlowe dla Wyrobow Chemiczno-Farmaceutycznych.

Process and furnace installation for the production of carbon disulfide. No. 435,195. Saurefabrik Schweizerhall.

Process for the polymerization of diolefines with a catalyst comprising a peroxide derivative of tetrahydrofurfurane. No. 435,198. Les Usines de Melle, S. A.

Process for the manufacture of ethylene oxide by passing a mixture of ethylene, oxygen and a diluent not reactive through a catalyst at 100-450° C. No. 435,224. U. S. Industrial Alcohol Co.

Process for the production of filaments from polyvinyl resins. No. 435,253. I. G. Farbenindustrie A. G.

Detergent compositions and process for their production. No. 435,291. Colgate-Palmolive-Peet Company.

Process for the preparation of the phosphodichloride of 4-amino-benzene-sulfonamide. No. 435,311. Produits Roche S. A.

Process for preventing surface corrosion of iron by corrosive waters. No. 435,347. I. G. Farbenindustrie A. G.

Stabilized solutions of hypochlorite and process for their production. No. 435,350. Clorox Chemical Company.

Process for the transformation of carbon monoxide into hydrocarbons by means of hydrogen. No. 435,351. N. V. Internationale Koolwaterstoffen Synthese Mij.

Preparation of pulp wood for papermaking comprising transversal compression of large pieces (with respect to the fibre) to reduce the volume to about a quarter. No. 434,886. C. Miedler.

Gummed paper and process for its manufacture. No. 434,935. Jagenberg-Werke A. G.

Process for sizing of paper. No. 434,991. I. G. Farbenindustrie A. G.

CANADIAN PATENTS

Granted and Published February 27, 1940.

Infusible, insoluble, rubber-like substance comprising an alkyd complex derived by condensation of a carboxylic acid containing at least 3 carboxyl groups, and a long chain glycol containing at least 8 atoms in the chain separating the hydroxyl groups. No. 387,068. American Cyanamid Company.

Tracing sheet of transparent vinyl resin made by conjoint polymerization of a vinyl halide with a vinyl ester of an aliphatic acid. No. 387,116. Carbide and Carbon Chemicals, Limited.

Vinyl resin composition comprising a vinyl resin identically with a resin resulting from the conjoint polymerization of a vinyl halide with a vinyl ester of an aliphatic acid, and a solvent comprising dipropyl ketone. No. 387,117. Carbide and Carbon Chemicals, Limited.

Coating composition containing as film-forming material a mixture of nitrocellulose and a vinyl resin resulting from the conjoint polymerization of a vinyl halide and a vinyl ester, and a solvent. No. 387,118. Carbide and Carbon Chemicals, Limited.

Manufacture of abrasive coated products. No. 387,119. Carborundum Company.

Vulcanizing rubber in presence of a compound having the formula $(R\text{-}S\text{-}A)_3N$ wherein R is an organic radical with the free valence on a carbon atom and A is an alkylene group. No. 387,126. The B. F. Goodrich Company.

Preparing stable emulsions by adding about 4 parts of liquid waxy material, with agitation, to an aqueous alkaline solution containing from one to two parts of a water-insoluble, acid-precipitable protein and an emulsifying agent. No. 387,131. The Institute of Paper Chemistry.

Preparing an alkaline earth filler for papermaking by mixing a sludge of alkaline earth solids in finely divided form with an emulsion of paraffin stabilized with an acid-precipitable protein, and adding an acid reagent to said emulsion. No. 387,132. The Institute of Paper Chemistry.

Making phthalocyanine pigments by dissolving phthalonitrile in diethylene glycol mono-butyl ether, adding copper to the solution, and heating to the ether boiling point. No. 387,133. Interchemical Corporation.

Deodorant powder comprising zinc peroxide, a moisture absorbent material, and a neutral body material. No. 387,135. C. E. Jamieson & Company.

Separation of olefines from a mixture of olefines, paraffins and hydrogen by repeatedly extracting with a solvent selective for olefines. No. 387,141. Les Usines de Melle.

Stable calcium hypochlorite composition. Nos. 387,143 and 387,144. The Mathieson Alkali Works.

Textile-treating composition comprising a disperse phase, a soluble polyvalent metal salt imparting water-repellency and finish, and tapioca. No. 387,153. Scholler Brothers, Limited.

Distillation production of an unsaturated ketone from the corresponding keto-alcohol in the presence of a dehydrating catalyst by employing as reflux the stratified unsaturated ketone phase obtained by condensation. No. 387,154. Shell Development Corporation.

Manufacture of aromatic arsenic and antimony compounds. No. 387,168. Winthrop Chemical Co., Inc.

Yarn coating composition containing gelatine, a sulfonated oily material, and a water-soluble resin. No. 387,173. Camille Dreyfus.

Granted and Published March 5, 1940.

Photographic dyestuff and color former. No. 387,173. General Aniline & Film Corporation.

Production of alloys of copper, nickel or silver and a metal of the titanium periodic group by mixing the former in powdered form with the powdered hydride of the latter, heating to dissociate the hydride, and then increasing temperature to fusion. No. 387,216. Alloys, Limited.

Resinous composition obtained by reacting urea, formaldehyde and a monohydric alcohol in the presence of a catalyst. No. 387,224. Canadian Industries, Limited.

Copper base alloy containing cobalt and iron. No. 387,236. Canadian Westinghouse Co., Limited.

Manufacture of new basic condensation products. No. 387,237. Chemical Works, formerly Sandoz.

Detergent obtained by reacting a fatty material such as fatty oils or fatty acids, with an isobutylene derivative of the class consisting of beta methyl glycerine and beta methyl glycidol which has been subsequently reacted with sulfuric acid. No. 387,238. Colgate-Palmolive-Peet Company.

Processing of fibrous materials. Nos. 387,243 to 387,246 incl. Dominion Rubber Company, Limited.

Resinous composition obtained by precipitation when aliphatic hydrocarbon solvent is added to a solution of the resinous reaction product of urea, formaldehyde and aliphatic monohydric alcohol. No. 387,247. E. I. du Pont de Nemours & Co.

Fabric impregnated and coated with a composition comprising a urea-aldehyde-monohydric-alcohol resinous product and a softening agent. No. 387,248. E. I. du Pont de Nemours & Co.

Manufacture of patent leather including the steps of applying a pyroxylin-oil undercoat and a top coat of a resinous reaction product of urea, formaldehyde, and an aliphatic monohydric alcohol. No. 387,249. E. I. du Pont de Nemours & Co.

Production of thioacetalsulfonic acids by reacting one molecule of benzaldehyde sulfonic acid with about two molecules of a mercaptan containing a benzene nucleus. No. 387,254. J. R. Geigy S. A.

Manufacture of moth-proofing composition by reacting one mole of a cyclic imidohalide consecutively with each time about one mole of three different compounds selected from araliphatic and benzene-aromatic amines and mercaptans and of monohydric phenols, the three being selected so that at least one halogen and one sulfonic acid group will remain in the final product. No. 387,255. J. R. Geigy S. A.

Manufacture of white lead pigments. No. 387,260. Hughes-Mitchell Processes, Inc.

Stabilized divinyl ether. No. 387,271. Merck & Co., Inc.

High temperature refractory made from zircon, ferro-silicon and phosphoric acid. No. 387,283. Power Patents Company.

Heat resistant basic refractory comprising 16-66 parts zirconia and 76-20 parts ferro-silicon bonded with about 8-14 parts of zircon phosphates. No. 387,284. Power Patents Company.

Making a bonded refractory by wetting the aggregate with a solution of a metal halide, forming the phosphate of the metal of the halide by addition of phosphoric acid, and firing. No. 387,285. Power Patents Company.

High temperature refractory made by mixing fine and coarse zircon with small amounts of metallic oxides, reacting with orthophosphoric acid, drying, and firing at 600° F. No. 387,286. Power Patents Company.

Making a strong porous refractory by mixing prepared porous refractory grog with its own weight of native refractory material and a bonding agent, and firing. No. 387,287. Power Patents Company.

Making heat insulating product by mixing milled grain zircon, grain zircon, powdered aluminum-copper alloy, granulated rosin, gelatine, calcium hydrate and sufficient water to produce a pasty plastic, heating to temperature of gas formation, baking at 300° F., and firing at 2000-2500° F. No. 387,288. Power Patents Company.

Production of high anti-knock motor fuel by mixing synthetic fuel from carbon monoxide and hydrogen with normally gaseous hydrocarbons capable of polymerization to normal liquid products, and maintaining the mixture at elevated temperature. No. 387,289. Process Management Co., Inc.

Aromatic polyether amine. No. 387,299. Röhm & Haas Company.

Sulfonate of aromatic polyalkylene ethers. No. 387,300. Röhm & Haas Company.

Cellulose derivative coating composition. No. 387,301. Sealkote Corporation.

Process for producing unsaturated alcoholic bodies from saturated polyhalides having at least 3 carbon atoms in an aliphatic chain of which two contiguous carbon atoms are halogenated and the contiguous third carbon atom is linked with at least one hydrogen atom. No. 387,303. Shell Development Company.

Hardening of polymerization products of butadiene by heating to form 120-130° C. in a substantially oxygen-free atmosphere containing vapors of chlorobenzene. No. 387,304. Shell Development Corporation.

Production of alkaline earth salts of alkyl sulfates by treating at 60-120° C. a sulfuric acid containing alkyl acid sulfate of at least 7 carbon atoms with a basic alkaline earth metal compound in the presence of sufficient acetone to cause precipitation of crystalline earth metal sulfate. No. 387,305. Shell Development Co.

Manufacture of amino or imido group compounds. No. 387,311. Society of Chemical Industry in Basle.

Non-fibrous material swelling in water having a strongly adherent, non-tacky coating thereon comprising a cellulose derivative and a small amount of a hydrophilic colloid dispersed therein in the form of a multiplicity of small particles. No. 387,317. Sylvania Industrial Corporation.

Rubber laminated with rubber hydrochloride. No. 387,326. Wingfoot Corporation.

Molybdenite ground to a semicolloidal condition as a metal lubricant. No. 387,328. Michael Joseph Galvin.

Obtainment of ergot preparation. No. 387,344. Eli Lilly and Company.

Granted and Published March 12, 1940.

Waterproofing composition consisting of linseed oil, turpentine, kerosene oil, castor oil, glycerine and china wood oil. No. 387,351. Florence Elsie Deacon.

Cleaning composition consisting of a concentrated aqueous solution of soap, sal ammoniac, sodium thiosulfate, together with sufficient quan-

tities of Javel water and gasoline for complete cleansing and bleaching. No. 387,366. Joseph A. Lévesque.

Improving the quality of furs by treating the surface with a colloidal emulsion containing wax and the elements of a synthetic resin or plastic, in uncombined form. No. 387,369. Oscar F. Muller.

Improvement of milling products by intimately mixing with a powdered active organic peroxide and a powdered bromate or iodate. No. 387,370. Frederic H. Penn.

Method of producing bronze powder from paste. No. 387,378. Aluminum Company of America.

Production of alcohol from olefines by hydrating an olefinic hydrocarbon in the presence of a boron halogen. No. 387,398. Canadian Industries, Limited.

Emulsifying agent comprising a product formed by reaction of a fatty substance with a compound selected from morpholine and water-soluble, moderately volatile, highly basic, morpholine addition and substitution products. No. 387,403. Carbide and Carbon Chemicals, Limited.

Purification of carbon or graphite articles by subjecting them to electrical heating under pressure. No. 387,410. The Dow Chemical Company.

Manufacture of synthetic resin from 50° to about 100° C., in the absence of catalyst and substantial amount of water, in presence of a monohydric alcohol, reactants consisting solely of urea and aldehyde. No. 387,411. E. I. du Pont de Nemours & Co., Inc.

Preparation of vinyl acetal resin by reacting a polyvinyl compound containing hydroxyl groups with an aldehyde in the presence of an acid catalyst and neutralizing the acid with an amine selected from water-insoluble alkyl and alkyl-alicyclic secondary and tertiary amines while the resin is in solution. No. 387,412. E. I. du Pont de Nemours & Co., Inc.

Filter-aid having decolorizing properties, consisting of kieselguhr having a material portion of its particles coated with deposited and activated carbon. No. 387,415. The Evanston Company.

Oil removal from egges by treatment with an acid material and a wetting agent. No. 387,429. Industrial Patents Corporation.

Manufacture of cadmium red by calcining cadmium thioselenide in presence of cadmium oxide. No. 387,430. Interchemical Corporation.

Manufacture of ascorbic acid by reacting sorbose with oxygen and treating the oxidized solution with hydrochloric acid. No. 387,438. Merck & Co., Inc.

Bituminous composition comprising an asphalt and a hydrocarbon polymer of the type of polyisobutylene having molecular weight greater than about 800. No. 387,448. Shell Development Company.

Accelerating the loosening of hair of skins and hides in alkaline soaking operations by adding a formaldehyde sulfoxylate to the bath. No. 387,456. Wallerstein Company, Inc.

Dyeing of textiles having as base cellulose acetate or other cellulose esters or ethers with azo dyestuffs by applying a diazotisable amine and a coupling component to the material and forming an azo dyestuff therein from such components. No. 387,464. Henry Dreyfus.

Manufacture of cellulose derivatives. No. 387,465. Henry Dreyfus.

Stable aqueous casein paste paint containing: casein 10%, alkali salt of an amphoteric metal from the group aluminum, antimony, tin and vanadium 0.6%, a soluble borate 1.8%, pigments and fillers 85% and oils 2.6%. No. 387,468. Canadian Gypsum Company Limited.

ENGLISH COMPLETE SPECIFICATIONS*

Accepted and Published January 31, 1940.

Treatment of textile materials. Nos. 517,114 and 517,115. Zschimmer & Schwartz Chemische Fabrik Dolau.

Synthetic resin adhesive and objects using it. No. 516,915. Aero Research, Ltd.

Treatment of zein. No. 517,165. International Patents Development Co.

Manufacture of cementitious paints. No. 516,969. Lignocrete, Ltd.

Manufacture of azo dyestuffs. No. 517,023. Society of Chemical Industry in Basle.

Coating surfaces with cellulose derivative lacquers. No. 516,973. Commercial Solvents Corp.

Manufacture and use of azo dyes. No. 516,929. G. H. Ellis and H. C. Olpin.

Manufacture of triarylmethane dyestuffs. No. 516,930. I. G. Farbenindustrie A. G.

Production of capillary active substances. No. 516,978. Deutsche Hydrierwerke A. G.

Polymerization of unsaturated organic compounds. No. 516,931. E. I. du Pont de Nemours & Co., Inc.

Composition and process for the preparation of azo-colors on the fibre. No. 517,030. Chemical Works formerly Sandoz.

Manufacture of reaction products from aromatic hydrocarbons. No. 516,936. I. G. Farbenindustrie A. G.

Production of dielectrically high quality titanium dioxide. No. 516,999. Fides Ges. für die Verwaltung und Verwertung von Gewerblichen Schutzrechten.

Production of dielectrically high quality ceramics. No. 516,998. Fides Ges. für die Verwaltung und Verwertung von Gewerblichen Schutzrechten.

Production of films, foils, filaments, etc. of regenerated cellulose. No. 517,047. Schlesische Zellwolle A. G.

Improving the resistance of metals to corrosion. No. 517,049. Pyrene Co., Ltd.

Manufacture of derivatives of the saturated and unsaturated cyclopentanopolyhydrophenanthrene series. No. 517,078. Society of Chemical Industry in Basle.

Stabilization of plastic polymers of halogenobutadienes. No. 517,125. E. I. du Pont de Nemours & Co., Inc.

Artificial leather and like coated fabrics. No. 517,131. A. L. Lever & P. Alexandre.

Manufacture of cyclic ketones of the cyclopentanopolyhydrophenanthrene series. No. 517,133. Society of Chemical Industry in Basle.

Manufacture of binding agents of the Portland cement type. Nos. 517,136 and 517,160. Berginspektion Rüdersdorf, Zweigniederlassung der Preus, Bergwerks und Hütten A. G.

Setting composition containing calcined magnesite. No. 517,137. British & International Flooring Co., Ltd.

Production of formamide derivatives. No. 517,143. E. I. du Pont de Nemours & Co.

Production of solid paraffine from carbon monoxide and hydrogen. No. 517,002. Studien und Verwertungs Ges.

Stabilizing cellulose esters. No. 516,945. Afag Finanzierung A. G.

High quality alloys. No. 517,083. Seri Holding S. A.

* Subject to opposition for two months from date of acceptance.

Chemical solidification of loose or porous masses. No. 517,088. Tiefbau und Kalteinindustrie Ges. vorm. Gebhardt & Koening Nordhausen.

Finishing processes for textile materials. No. 517,011. Tootal Broadhurst Lee Co., Ltd.

Accepted and Published February 7, 1940.

Treatment of metallic baths by certain solid materials. No. 517,365. Société d'Electro-Chimie, d'Electro-Metallurgie, et des Acieries Electriques d'Ugine.

Far-reaching deoxidation of steel by carbon. No. 517,366. Société d'Electro-Chimie, d'Electro-Metallurgie, et des Acieries Electriques d'Ugine.

Production of starch grits. No. 517,368. International Patents Development Co.

Manufacture of gasoline and fuel oil by cracking crude petroleum stock. No. 517,269. Sinclair Refining Company.

Preparation of therapeutically useful heterocyclic compounds. No. 517,272. May & Baker, Ltd.

Treatment of carbon black and lamp black. No. 517,274. Columbian Carbon Co.

Catalytic destructive hydrogenation of heavy oils or residues containing asphalt. No. 517,374. N. V. Internationale Hydrogeneeringsoctrooien Mij.

Manufacture of alpha-dicarbonyl compounds of the cyclopentanopolyhydrophenanthrene series. No. 517,276. Society of Chemical Industry in Basle.

Manufacture of ketones of the cyclopentanopolyhydrophenanthrene series. No. 517,277. Society of Chemical Industry in Basle.

Manufacture of polyoxy compounds of the cyclopentanopolyhydrophenanthrene series. No. 517,288. Society of Chemical Industry in Basle.

Production of bases for lacquers, plastics, etc. Nos. 517,324 and 517,379. Binney & Smith Co.

Manufacture of chlorine and alkali metal nitrates. No. 517,174. Imperial Chemical Industries.

Manufacture of synthetic rubber. No. 517,302. Istituto per lo Studio della Gomma Sintetica.

Anti-halation layers for photographic multi-layer sensitive material. No. 517,193. I. G. Farbenindustrie A. G.

Polymerization of symmetrical dichlorethylene. No. 517,195. Röhm & Haas Ges.

Production of urea formaldehyde condensation products. No. 517,196. Albert Products, Ltd.

Olefine oxidation and catalyst therefor. Nos. 517,332 and 517,333. Carbide and Carbon Chemicals, Limited.

Manufacture of polyazo dyestuffs. No. 517,335. I. G. Farbenindustrie A. G.

Production of water-repellent fibrous materials. No. 517,337. I. G. Farbenindustrie A. G.

Production of capillary active substances. No. 517,339. Deutsch Hydrierwerke A. G.

Manufacture of aldehydes of the cyclopentanopolyhydrophenanthrene series. No. 517,346. Society of Chemical Industry in Basle.

Treatment of yeast suspensions. No. 517,351. Svenska Jästfabrik Aktiebolaget.

Manufacture of flexible fibres from casein. No. 517,353. S. P. Gould and E. O. Whittier.

Manufacture of non-poisonous illuminating gas. No. 517,354. F. Bossner and C. Manischka.

Manufacture of iodated esters. No. 517,382. Imperial Chemical Industries, Ltd.

Manufacture of wool dyestuffs of the anthraquinone series. No. 517,396. I. G. Farbenindustrie A. G.

Production of dextran ethers. No. 517,397. G. L. Stahly and W. W. Carlson.

Production of ester derivatives of dextran. No. 517,398. G. L. Stahly and W. W. Carlson.

Preparation of natural vitamins concentrates. No. 517,401. J. C. Drummond.

Plasticizers and plasticized coating compositions. No. 517,236. Sylvania Industrial Corporation.

Production of technically valuable chlorinated hydrocarbons. No. 517,213. Röhm & Haas Ges.

Diesters of unsaturated glycols and process of preparing. No. 517,247. Armour & Company.

Manufacture of paper. No. 517,258. Paper Patents Co.

Manufacture of ketones of the cyclopentanopolyhydrophenanthrene series. No. 517,307. Society of Chemical Industry in Basle.

Accepted and Published February 14, 1940.

Preparation of emulsions. No. 517,612. Zschimmer & Schwartz Chemische Fabrik Dolau.

Manufacture of pentamethyleneoxide and pentamethylenesulfide compounds. No. 517,414. I. G. Farbenindustrie A. G.

Electrochemical treatment of metal. No. 517,415. S. J. Blaust and H. M. Lang.

Production of wool-like fibres from cellulose. No. 517,464. R. Wallach.

Manufacture of sulfur-containing organic compounds. No. 517,421. Imperial Chemical Industries, Limited.

Preparation of amino alcohols. No. 517,525. Chemical Works formerly Sandoz.

Manufacture of water-gas enriched with hydrogen. No. 517,530. Gas Light & Coke Co.

X-ray contrast media. No. 517,425. Imperial Chemical Industries, Limited.

Steroid ketone compounds and their preparation. No. 517,537. Parke Davis & Co.

Manufacture of nitrogenous anthraquinone derivatives. No. 517,434. Society of Chemical Industry in Basle.

Separation and purification of carbonyl compounds obtainable by side chain degradation of steroids. No. 517,435. Society of Chemical Industry in Basle.

Manufacture of hydroxylamine hydrochloride. No. 517,436. I. G. Farbenindustrie A. G.

Recovery of phenols from oils and waste aqueous liquors. No. 517,618. I. G. Farbenindustrie A. G.

Separation by distillation of components of a mixture of hydrocarbons. No. 517,440. M. W. Kellogg Co.

Alloys and their manufacture. No. 517,442. General Electric Company, Ltd.

Production and use of accelerators for rubber vulcanization. No. 517,451. Monsanto Chemical Company.

Regenerating copper contained in the waste liquors of cuprammonium artificial silk production. No. 517,452. I. G. Farbenindustrie A. G.

Process and plant for the hydrolysis of cellulose materials. No. 517,454. H. M. L. R. Fouque.

Foreign Chemical Patents

Belgian, Canadian, English & French—p. 14

Conversion of alkaline-earth metal oxalates, and manufacture of alkali metal hydroxides. No. 517,455. Imperial Chemical Industries, Limited.

Manufacture of azo pigments. No. 517,456. E. I. du Pont de Nemours & Co., Inc.

Nitrogen-containing organic compounds and their application to textiles. No. 517,474. Imperial Chemical Industries, Limited.

Preparation of improved coloring matters. Nos. 517,475 and 517,476. Imperial Chemical Industries, Limited.

Photographic layers and process of manufacture. No. 517,480. B. Gaspar.

Manufacture of sulfurized dihydropolycyclic aromatic hydrocarbons, and lubricating compositions containing them. No. 517,582. E. I. du Pont de Nemours & Co.

Colored photographic layers and manufacture thereof. No. 517,559. B. Gaspar.

Preparation of silver halide gelatine emulsions for the silver dyestuff bleach-out process. No. 517,628. Kodak, Ltd.

Manufacture of soluble nitro dyestuffs. No. 517,629. Imperial Chemical Industries, Limited.

Manufacture of colored organic compounds. No. 517,630. Imperial Chemical Industries, Limited.

Organic nitrogen compounds and their application. No. 517,632. Imperial Chemical Industries, Limited.

Rendering fibrous materials waterproof and water-repellent. No. 517,638. I. G. Farbenindustrie A. G.

Production of pigmented bases for the production of lacquers, plastics, etc. No. 517,640. Binney & Smith Co.

Method of and apparatus for revaporizing liquefied gas. No. 517,641. Linde Air Products Co.

Manufacture of azo dyestuffs. No. 517,642. Society of Chemical Industry in Basle.

Manufacture of rubber flooring material. No. 517,609. G. MacLelland & Co., Ltd.

Manufacture of sulfur-containing organic compounds. No. 517,457. Imperial Chemical Industries, Limited.

Accepted and Published February 21, 1940.

Oil soluble resin and method of making. No. 517,764. I. Rosenblum.

Manufacture of foam-generating substances. No. 517,767. Pyrene Co., Ltd.

Manufacture of hydrocarbon gases. No. 517,668. T. D. Kelly.

Dyes and photographic silver halide emulsions containing them. No. 517,769. Kodak, Ltd.

Production of foam. No. 517,812. Pyrene Co., Ltd.

Chemical treatment of leaf tissues of plants of the *Agave* family and *Sanseviera*. No. 517,729. Avex, Ltd.

Aluminum alloys. No. 517,731. High Duty Alloys, Ltd.

Treatment of iron ores preliminary to smelting. No. 517,867. F. W. Harbord.

Manufacture of steel, or iron or steel alloys. No. 517,813. W. J. Campbell, A. H. Chiverton and H. N. Gardiner.

Manufacture and production of synthetic resins. No. 517,738. I. G. Farbenindustrie A. G.

Adhesives. No. 517,816. D. B. Porritt and J. R. Scott.

Manufacture of acid-proof mortars. No. 517,672. I. G. Farbenindustrie A. G.

Manufacture of 1-amino-2-chloro (or bromo)-4(or 6)-nitrobenzene-6(or 4)sulfonic acid. No. 517,673. I. G. Farbenindustrie A. G.

Manufacture of 2-chloro (or bromo)-4(or 6)-nitro-1-aminobenzene-6(or 4)-sulfonic acid. No. 517,674. I. G. Farbenindustrie A. G.

Manufacture of formaldehyde. No. 517,740. Distillers Co., Ltd.

Manufacture of therapeutically active compounds. No. 517,682. G. M. Dyson.

Process for the manufacture of condensation products. No. 517,684. I. G. Farbenindustrie A. G.

Manufacture of d-halogen-vinyl methyl ketones. No. 517,685. I. G. Farbenindustrie A. G.

Production of coated fish glue layers for photo-mechanical printing processes. No. 517,686. Hull Fish Meal & Oil Co., Ltd.

Improving the stability to heat of shaped polyvinyl chloride. No. 517,689. I. G. Farbenindustrie A. G.

Process for the manufacture of beta-indole acetic acid. No. 517,692. I. G. Farbenindustrie A. G.

Manufacture of hollow rubber articles. No. 517,693 and 517,694. R. W. Sampson.

Method of producing soluble benzyl ether or dextran. No. 517,820. G. L. Stahly and W. W. Carlson.

Production of pure hydrocarbons of the benzene series by distillation and apparatus therefor. No. 517,822. Niederschlesische Bergbau A. G.

Production of titanium dioxide pigments. No. 517,742. British Titan Products Co., Ltd.

Production of organic acids by fermentation. No. 517,793. Anthony & Co., Ltd.

Preparation of catalysts. No. 517,794. Synthetic Oils, Ltd.

Method of preparing quinuclidine, and derivatives thereof. No. 517,830. Kastel Tvornica Kemijsko-Farmaceutskih Proizvoda.

Coating of articles with phenol-formaldehyde resins. No. 517,833. Heresite & Chemical Co.

Apparatus for catalytic reactions. No. 517,744. Hercules Powder Co.

Manufacture of aminohydrazines. No. 517,747. Society of Chemical Industry in Basle.

Dyeing of textile materials with vat dyestuffs. No. 517,750. Courtaulds, Ltd.

Production of artificial threads, filaments, and formations of cellulose ethers and esters, and regenerated cellulose. No. 517,886. F. D. Lewis.

Treatment of cellulosic textile materials. No. 517,890. Courtaulds, Ltd.

Production of films, foils, filaments, etc. of regenerated cellulose. No. 517,891. Schlesische Zellswolle A. G.

Production of starch conversion products. No. 517,892. A. E. Staley Mfg. Co.

Manufacture of abrasive alumina. No. 517,858. Chemical Construction Corp.

Processes and apparatus for the manufacture of agglomerates. No. 517,798. A. L. M. A. Rouy, R. Dufour and H. A. Leduc.

Catalytic polymerization of olefines. No. 517,799. I. G. Farbenindustrie A. G.

Distillation of crude oil petroleum or tars obtained from coal and shale. No. 517,802. R. Adler.

Manufacture of isobutane from normal butane. No. 517,758. N. Y. de Bataafsche Petroleum Mij.

Accepted and Published February 28, 1940.

Production of composite titanium pigments. No. 517,913. E. I. du Pont de Nemours & Co., Inc.

Manufacture of azo dyestuffs. No. 517,918. Society of Chemical Industry in Basle.

Treatment of textile materials. No. 518,072. Imperial Chemical Industries, Ltd.

Production of p-amino-benzene-sulfonamide derivatives. No. 517,919. Naamlooze Vennootschap Orgachemia.

Manufacture of compounds having the action of vitamin-E. No. 517,932. Society of Chemical Industry in Basle.

Working-up of ammoniacal solutions of heavy metals. No. 517,933. I.G. Farbenindustrie A. G.

Manufacture of ethers of phenylmethylcarbitol and its homologues, and decomposition thereof. No. 517,934. Distillers Co., Ltd.

Manufacture of derivatives of the saturated and unsaturated cyclopentanopolyhydrophenanthrene series. No. 517,943. Society of Chemical Industry in Basle.

Polymers of methacrylic acid methyl ester. No. 517,948. Röhm & Haas A. G.

Hydrogenation of oiticica oil. No. 517,949. E. I. du Pont de Nemours & Co., Inc.

Manufacture of synthetic rubber. No. 517,951. I. G. Farbenindustrie A. G.

Hydrocarbon oil conversion. No. 518,024. N. V. Nieuwe Octrooi Mij.

Manufacture of magnesium dust briquettes and production of magnesium therefrom. No. 517,994. Magnesium Metal Corporation, Ltd.

Production of malleable iron. No. 518,089. British Furnaces, Ltd.

Stabilization of polyvinyl resins. No. 518,099. Kodak, Ltd.

Incorporating phosphatides into edible paste goods and bakery products. No. 518,103. M. F. Niescher.

Bright annealing of the type containing a constituent volatile at the annealing temperature. No. 518,132. General Electric Company, Ltd.

Treatment of soya beans. No. 517,997. W. J. Plews.

Process of pickling iron and its alloys. No. 517,998. P. de Lattre.

Polyvinyl acetal resin compositions. No. 518,006. British Thomson Houston Co., Ltd.

Vinyl-type resin compositions. No. 518,027. Armour & Company.

Regeneration of protein animal substances, fibroins, and sericins. No. 517,956. S. A. Brevetti Mario Piacenza.

Manufacture of compounds of the cyclopentanopolyhydrophenanthrene series. No. 518,043. Schering A. G.

Manufacture of ethylene derivatives. No. 518,149. Boots Pure Drugs Co., Ltd.

Polymerization of olefines. No. 518,054. I. G. Farbenindustrie A. G.

Manufacture of thermo-setting synthetic resins by the condensation of alkylene oxides with anhydrides of polybasic acids. No. 518,057. De Trey Freres S. A.

Corrosion inhibitors for pickling baths. No. 518,157. United States Rubber Co.

Preservation of rubber, oils, and other oxidizable substances. No. 518,158. United States Rubber Co.

Adhesive composition. No. 518,010. Stein-Hall Mfg. Co.

Vulcanization of rubber. No. 518,160. Consolidated Rubber Manufacturers, Ltd.

FRENCH PATENTS

Granted October 16, 1939; Published November 2, 1939.

Process of bleaching textile fibres. No. 50,239/690,220*. I. G. Farbenindustrie A. G.

Process of improving the light fastness of dyes. No. 852,030. I. G. Farbenindustrie A. G.

Process of improving the quality of dyes obtained on cellulose fibres. No. 852,031. I. G. Farbenindustrie A. G.

Dyeing of mixed cellulose or regenerated cellulose esters or ethers. No. 852,155. I. G. Farbenindustrie A. G.

Process and apparatus for manufacturing magnesium. No. 851,990. S. A. pour l'Industrie de l'Aluminium.

Process and apparatus for the treatment of ores. No. 852,005. P. Rzezacz.

Separation of lead and zinc from oxides containing them. No. 851,909. J. Lahilhanne.

Preparation of reaction briquettes used in obtaining magnesium. No. 851,929. "Astral" (S. A.).

Process for preparing substances containing iron and silicic acid, and particularly ores poor in iron and rich in silicic acid. No. 852,083. C. Schunck.

Metallizing process. No. 851,968. M. de Domenico and G. B. R. de Domenico.

Production of copper lining on iron. No. 851,971. American Chemical Paint Co.

Process of depositing anti-oxidation protective films on magnesium and magnesium alloys. Nos. 852,152 and 852,153. Langbein-Pfanhauser-Werke A. G.

Process of fixing non-ferrous metal linings on cast iron pieces. No. 852,156. Goldschmidt A. G.

Process of collecting ammonia and other easily volatilized bases. No. 851,942. I. G. Farbenindustrie A. G.

Purification of nitriles. No. 851,980. E. I. du Pont de Nemours & Co., Inc.

Cellulose ethers. No. 851,999. E. I. du Pont de Nemours & Co., Inc.

Thiocarbonates and imino-thiocarbonates of polyhydroxylated aromatic compounds. No. 852,020. Kalle & Co. A. G.

Process for reducing carbohydrates of the starch group. No. 852,033. I. G. Farbenindustrie A. G.

Nitrocellulose products and process of manufacture. No. 852,075. Sylvania Industrial Corporation.

Process of manufacture and application of new mercapto-thiazol derivatives. No. 852,118. Imperial Chemical Industries, Ltd.

Polyhydroxylated aliphatic aldehydes and process of preparation. No. 852,136. I. G. Farbenindustrie A. G.

Manufacture of dehydrated borax by multiple heating of crystallized borax. No. 852,143. Gebr. Borchers A. G.

Obtainment of krypton and xenon from air by washing with liquid air. No. 852,154. I. G. Farbenindustrie A. G.

Manufacture of pyrrols and hydrogenated pyrrols. No. 852,169. I. G. Farbenindustrie A. G.

* Additions to previously issued patents. Second number is that of the original.

Other French Patents, granted Oct. 16, 1939; Published Nov. 2, 1939, will be given next month.

ALKYPHEN
424,265

425,175

NYRONE
424,927

Garbex
424,210

SOTE
425,570

Jolly Gulp
411,705

425,274

420,087

MOHAWK FLINT
424,990

418,847

SHELL-MARK
423,930

SPARK
425,296

FRIGID ZONE
423,044

MINI-MAX
424,177

SURFRENU
423,833

RASEMA
425,418

422,598

ANAPA
423,484

424,268

CRYST-O-KLEER
424,463

METALITE
425,066

AKOROL
423,729

KARWENDOL
408,716

KURO
424,599

ZATONE
424,710

AKOROLIT
423,730

NO LUB
424,269

Moor Man's
416,107

INSURO
424,624

PUMITE
399,953

KOLOFIX
424,439

PATENEL
424,709

SOLEDRIN
421,399

SOLARITE
425,286

MANADEL
424,816

CHIP-PROOF
418,912

424,215

423,442

HyLo
421,881

TRI-DIMENSIONAL
424,772

WHITE CAP
419,346

Sky-tex
425,037

BIXATAL
424,935

PENN MEDAL
404,778

DRYLITE
424,216

ALADDINITE
424,983

LIXA-BETA
424,936

RPM DELO
424,446

Trade Mark Descriptions†

424,265. I. G. Farbinindustrie A. G. Frankfort-on-the-Main, Germany, Oct. 6, 1939; for artificial resins in the form of solids, solutions or emulsions suitable for various uses in the industrial arts. Since July 5, 1939.

411,705. Pectin Industries, Inc., Chicago, Ill., Oct. 17, 1938; for Tubular Containers for frozen confections, and sold empty in trade. Since Oct. 1, 1938.

423,930. Shellmar Products Company, Mount Vernon, Ohio; Sept. 25, 1939; for bags made from transparent sheet material. Since Mar. 16, 1939.

423,833. Sears, Roebuck and Co., Chicago, Ill., Sept. 21, 1939; for lacquers for resurfacing rubber footwear. Since July 1937.

424,463. Chapman & Rodgers, Inc., Philadelphia, Pa., Oct. 21, 1939. Applicant disclaims the word "Kleer" apart from the mark. For window cleaning preparation. Since May 16, 1939.

408,716. Karwendel Gesellschaft Nachf. Rentschler & Cie, Laupheim/Wurttemberg, Germany; July 20, 1938; for chemical insecticides and plant life destroyers, disinfectants, preservatives for foods, perfumes, face and body powder, hair tonic, skin ointment, skin paste, skin cream, and rust preventatives of a chemical nature. Since November, 1931.

416,107. Moorman Manufacturing Co., Quincy, Ill.; Feb. 16, 1939. Under 10-year proviso; for stock dips. Since May, 1894.

421,399. E. R. Squibb & Sons, N. Y.; July 8, 1939; for ephedrin preparations for nasal administration. Since Jan. 21, 1939.

424,215. Arthur L. Waugh, Chicago, Ill.; October 4, 1939; applicant disclaims the words "Efficient" and "Detergent" except in conjunction with the other features of the mark. For germicides. Since Feb. 1, 1936.

424,935. William R. Warner & Co., Inc., New York, N. Y.; October 26, 1939; for Elixir vitamin B_1 preparation. Since Oct. 17, 1939.

424,936. William R. Warner & Co., Inc., New York, N. Y.; October 26, 1939; for Elixir vitamin B_1 preparation. Since Oct. 17, 1939.

425,175. Charles H. Wissinger, Logansport, Ind.; November 2, 1939; for salve for cancer treatment. Since Oct. 23, 1939.

425,274. Coffee Products of America, Inc., Ltd., (Ben-Hurr Laboratories, Los Angeles, Calif.); November 6, 1939; for tooth powder. Since Aug. 1, 1939.

425,296. Nyal Company, Detroit, Mich.; November 7, 1939; for dentifrice. Since Oct. 24, 1939.

425,418. Melvin Co., South Pasadena, Calif.; Nov. 8, 1939; for salve for relief of eczema and similar skin eruptions. Since June 30, 1932.

425,066. Sleight Metallic Ink Company of Illinois, Inc.; Chicago, Ill.; Oct. 30, 1939; for printing, lithographing, die-stamping, and plate printing inks. Since Mar. 17, 1939.

424,599. The Master Builders Company, Cleveland, O.; October 16, 1939; for materials for curing, hardening, and improving concrete surfaces. Since July 1, 1930.

424,624. Insuro Chemical Company, Lawrence, Mass.; Oct. 17, 1939; for liquid preparation for hardening, waterproofing, and accelerating the setting of Portland Cement. Since Aug. 10, 1938.

423,442. Societe des Soudres Castolin, S. A,. Lausanne, Switzerland; Sept. 8, 1939; for metal alloys in rod and wire form used in welding and for core solder. Applicant disclaims the words, "Trade Mark" apart from the mark. Since 1906.

404,778. Sears, Roebuck and Co., Chicago, Ill.; Apr. 1, 1938; for motor oil. Applicant disclaims the word, "Penn" apart from the mark. Since Feb. 18, 1937.

424,446. Standard Oil Company of California, Wilmington, Del. and San Francisco, Calif.; Oct. 11, 1939; for lubricating oils and greases. Since Apr. 5, 1939.

424,927. O-Cedar Corp., Chicago, Ill.; Oct. 26, 1939; for polishes and waxes for polishing furniture, walls, floors and automobiles. Since Oct. 2, 1939.

420,087. Bradford Oil Refining Co., Bradford, Pa.; June 2, 1939; for lubricant oils. The words "Permit No. 166" and "Quality" are disclaimed apart from the mark. Since April 15, 1939.

422,598. Reichhold Chemicals, Inc., Detroit, Mich.; Aug. 14, 1939; for resins. No claim is made to the words, "World-Wide Distribution" apart from the mark. Since June 20, 1939.

424,710. Atlas Powder Company, Wilmington, Del.; Oct. 20, 1939; for wood stain. Since Aug. 17. 1939.

399,953. Chamco Trading Corporation, New York, N. Y., to The Pozzorite Corporation, New York, N. Y.; Nov. 20, 1937; for volcanic pozzolana. Since Oct. 8, 1937.

425,286. Midwest Smokeless Fuel Corp., St. Louis, Mo.; Nov. 6, 1939; for processed coal fuel. Since Oct. 31, 1939.

421,881. Hylo Company, Inc., Houston, Tex.; July 24, 1939; for cleansing compounds for general household cleaning purposes. Since Apr. 5, 1939.

424,216. The Cowles Detergent Company, Cleveland, O.; Oct. 4, 1939; for detergent compound used in laundering, desizing, degreasing, or desoiling of textiles and general cleaning. Since Aug. 8, 1939.

424,210. Sherco Products Corporation, Syracuse, N. Y.; Oct. 4, 1939; for garbage deodorant and disinfectant, insect and animal repellent, having incidental cleansing properties. Since Sept. 25, 1939.

424,990. Behr-Manning Corporation, Troy, N. Y.; Oct. 28, 1939; for coated abrasives. No claim is made to the word, "Flint" apart from the mark. Since May 9, 1919.

424,044. National Accessories Stores, Inc., Utica, N. Y.; Aug. 24, 1939; for anti-freeze solution for automobiles. Since Aug. 14, '39.

423,484. Lobica, Inc., N. Y., N. Y.; Sept. 8, 1939; for medicinal preparation to be used for the treatment of nervous ailments and as a sedative. Since March, 1938.

423,729. I. G. Farbinindustrie A. G., Frankfort-on-the-Main, Germany; Sept. 19, 1939; for rust proofing agents and corrosion inhibitors. Since July 28, 1939.

423,730. I. G. Farbinindustrie A. G., Frankfort-on-the-Main, Germany; Sept. 19, 1939; for rust proofing agents and corrosion inhibitors. Since July 28, 1939.

424,439. Niagara Sprayer and Chemical Co., Inc., Middleport, N. Y.; Oct. 11, 1939; for insecticidal composition for use on plants. Since Apr. 24, 1939.

424,816. The Wm. S. Merrell Company, Cincinnati, O.; Oct. 23, 1939; for flavored preparation of calcium mandelate powder for the treatment of urinary infections. Since Oct. 12, 1939.

424,772. Charles Hellmuth Printing Ink Corporation, New York, N. Y.; Oct. 21, 1939; for printing and lithographic inks. Since Mar. 28, 1938.

† Trademarks reproduced and described include those appearing in the *U. S. Patent Gazettes*, Dec. 19, 1939, to Feb. 27, 1940, inclusive.

419,346. The Petrol Corporation, Los Angeles, Calif.; May 12, 1939; for gasoline. Since May 1, 1939.

424,983. Aladdin Radio Industries, Inc., Chicago, Ill.; Oct. 28, 1939; for magnetic powder and cores for use with inductive windings for radio and allied purposes. Since May 31, 1938.

425,570. Homasote Company, Inc., Fernwood, N. J.; Nov. 13, 1939; for glue. Since Oct. 15, 1939.

418,847. National Lead & Oil Company of Pa., Pittsburgh, Pa.; Apr. 28, 1939. Under 10-year proviso. For white lead dry and in oil. Since 1873.

424,177. National Carbon Company, Inc., New York, N. Y.; Oct. 3, 1939; for electric dry cell batteries. Since Aug. 15, 1939.

424,268. William O. Geyer (Scientific Glass Apparatus Co.) Bloomfield, N. J.; Oct. 6, 1939; for glass chemical apparatus and glass scientific appliances for laboratory use. No claim is made to the expressions "Quality" and "Bloomfield, N. J." apart from the mark. Since 1921.

424,269. William O. Geyer (Scientific Glass Apparatus Co.,) Bloomfield, N. J.; Oct. 6, 1939; for ground glass joints, stoppers and stop-cocks for glass chemical apparatus and glass scientific appliances for laboratory uses. Since Aug. 5, 1937.

424,709. Atlas Powder Company, Wilmington, Del.; Oct. 20, 1939; for coated fabrics. Since Oct. 10, 1939.

418,912. Associated Distributors, Inc., Chicago, Ill.; May 1, 1939; for cosmetics. Since March 18, 1938.

425,037. Allen Industries, Inc., Detroit, Mich.; Oct. 30, 1939; for rubberized or latex-coated cotton padding. Since Aug. 30, 1939.

425,269. Andrew Brown Co., Los Angeles, Calif.; Nov. 6, 1939; for lacquer. Since Oct. 30, 1939.

424,500. Sears, Roebuck and Co., Chicago, Ill.; Oct. 12, 1939; for paint. Since April 28, 1938.

421,705. The Lektrolite Corp., Stamford, Conn.; July 18, 1939; for catalytic cigar, cigarette, and pipe lighters, and parts for cigar, cigarette, and pipe lighters. Since Dec. 19, 1938.

417,814. North American Aviation, Inc., Inglewood, Calif.; for sealing compound used as a filler for crevices and the like for the purposes of stopping off leaks of gasolines, oils, or other fluids. Since Feb. 11, 1939.

425,082. The American Tobacco Co., New York, N. Y.; Oct. 31, 1939; for pyrophoric cigarette lighters. Since March 1, 1939.

420,765. Hygienic Tube & Container Corp., Newark, N. J.; June 21, 1939; for tubing and hollow tubes made of plastic materials. Since Oct. 15, 1938.

424,692. Mitchell & Peirson, Inc., Philadelphia, Pa.; Oct. 19, 1939; for leather. Since August 29, 1939.

425,233. The Diamond Match Co., New York, N. Y.; Nov. 4, 1939; for matches. Since 1930.

424,501. Sears, Roebuck and Co., Chicago, Ill.; Oct. 12, 1939; for prepared house paint. Since April 28, 1938.

424,060. Plant Chemicals Co., Ltd., Carmel, Calif.; Sept. 29, 1939; for chemical fertilizers for plants. Since August 24, 1939.

424,856. Orville E. McKim, Port Chester, N. Y.; Oct. 24, 1939; for insecticides. Since June 28, 1939.

374,310. The Diversey Corp., Chicago, Ill.; Jan. 16, 1939; for cleanser in powdered form having incidental water-softening properties. Since Nov. 7, 1938.

424,282. Mack Wilson (Timex Products Co.), St. Louis, Mo.; Oct. 6, 1939; for polishing compound for automobiles and painted, varnished or lacquered surfaces. Since March 13, 1939.

420,067. Robert F. McMillen (Kemgro Manufacturing Co.), Amarillo, Texas; June 1, 1939; for chemical fertilizers. Since May 15, 1939.

421,460. Huberd Shoe Grease Co., Inc., McMinnville, Oregon; July 11, 1939; for shoe grease and shoe oil. Since March 12, 1920.

423,295. Fidelity Laboratories, Inc., Chicago, Ill.; Sept. 5, 1939; for serum, virus and biological and pharmaceutical products. Since Feb. 26, 1925.

418,757. J. Hittner & Son, Inc., New York N. Y.; April 27 1939; for fluid valves. Since September 1933.

424,357. The International Nickel Co., Inc., New York, N. Y.; Oct. 9, 1939; for nickel hot rolled rounds, squares, hexagons and wire rods; nickel cold drawn rounds, squares, hexagons, and wire; and nickel cold rolled strips. Since Sept. 17, 1937.

424,356. The International Nickel Co., Inc., New York, N. Y.; Oct. 9, 1939; for castings made of nickel-copper alloys. Since Jan. 30, 1936.

424,355. The International Nickel Co., Inc., New York, N. Y.; Oct. 9, 1939; for castings made of nickel-copper alloys. Since May 20, 1932.

423,653. E. R. Ashbrook (Mission Chemical Co.), Kansas City, Mo.; Sept. 16, 1939; for fertilizers used primarily for growing grass. Since Jan. 1, 1939.

425,344. Mobile Paint Manufacturing Co. of Del., Inc., Wilmington, Del., and Mobile, Ala.; Nov. 7, 1939; for paint oil and varnish. Since Sept., 1934.

416,876. Steel Protection and Chemical Co., Inc., Mooresville, Ind.; March 9, 1939; for enamels and other protective coatings in the nature of paint. Since Dec. 1, 1937.

424,953. The Carter Oil Co., Tulsa, Okla.; Oct. 27, 1939; for antifreeze compound. Since Sept. 15, 1939.

421,604. Harry Friedman (Commercial Rubber Co.), Los Angeles, Calif.; July 15, 1939. For specially processed cement used for making rubber tacky. No claim is made to the word "Liquid" apart from the mark. Since July 10, 1939.

425,845. Frederick Stearns & Co., Detroit, Mich.; Nov. 20, 1939; for preparation used in treatment of muscular aches and pains and certain rheumatic conditions. Since Nov. 10, 1939.

413,084. Arthur Steinberg, Philadelphia, Pa.; Nov. 23, 1938; for hemostatic preparations. No claim is made to the word "Coagulant" apart from the mark. Since May, 1938.

424,726. International Chemical Co., Chicago, Ill.; for mixtures of oleaginous, waxy, and associated materials. Word "finish" disclaimed apart from the mark. Since Oct. 9, 1929.

425,436. Standard Oil Co. of New Jersey, Wilmington, Del.; Nov. 8, 1939; for antifreeze compounds, leak stopping and rust preventing compounds. Since Oct. 4, 1939, on stop leaking and rust preventing; and August 8, 1938, on anti-freeze compounds.

424,977. The Standard Supply Co., New Haven, Conn.; Oct. 27, 1939; for cleaning compounds and detergents for cleaning dishes, metals, floors, walls, bathtubs, etc. Since June 1, 1938.

Trade marks illustrated in last column above will be described next month.

NO YELLOW PERIL *with* WARNER CAUSTIC SODA

In the textile industry, re-treating cotton that has come out yellow because it has picked up iron from an alkaline processing solution, is an annoyance and expense that many mills are being saved by adopting Warner Caustic Soda. Its iron content is as low, or lower, than that of any caustic soda made by any method. Likewise, its salt content is reduced to a percentage that has no deleterious effect. The purity of Warner Caustic Soda may be an improvement and an economy in your application.

Why not get quotations on a car of regular production-grade Warner Caustic Soda? Your inquiry will have prompt attention.

OTHER WARNER CHEMICALS

Acid Sodium Pyrophosphate
Phosphoric Acid
Sodium Phosphates
Tetra Sodium Pyrophosphate
Liquid Caustic Potash
Bromine
Chlorine, Liquid
Sulfur Chloride
Carbon Tetrachloride
Trichlorethylene
Perchlorethylene
Carbon Bisulfide
Sodium Sulfide
Blanc Fixe
Barium Carbonate
Epsom Salt
Hydrogen Peroxide
Alumina Hydrate, Light
Chemical Grade Magnesia

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CHEMICAL COMPANY ☆ DIVISION OF

WESTVACO CHLORINE PRODUCTS CORPORATION

CHRYSLER BUILDING, NEW YORK, N. Y.